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Goulstonian Lectures
ON
PARATYPHOID INFECTIONS.

Delivered before the Royal College of Physicians of London.

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LECTURE II.*

II. THE DYSENTERIC TYPE.

THE term dysentery is apt to be too freely used for conditions in which a painful diarrhœa is the chief symptom. It should be limited clinically to those cases in which there is a frequent passage of blood and mucus accompanied by pain and tenesmus.

Can the Paratyphoid Organisms cause Dysentery?

The first point to be discussed is whether the paratyphoid organisms can cause dysentery. There have been hundreds of cases of dysentery, many of them from Gallipoli, whose stools yielded only the paratyphoid organisms in England.

Of the 310 cases from Gallipoli in my series 70 gave a history of dysentery; this is probably too low an estimate, as mild dysentery may have occurred and been overlooked by the patient. In very few of these cases was evidence of amœbic infection found.

It is beyond doubt that a very great number of amœbic infections occurred at Gallipoli, particularly in the months of July, August, September, and October. In November bacillary dysentery became more common, the Shiga bacillus being more frequently found than the Flexner.[1] Of the 70 cases of dysentery with paratyphoid stools that came under my notice, 58 of them began to be ill in the period of July to October—the amœbic period.

Lieutenant G. B. Bartlett, R.A.M.C., has kindly shown me the results of his post-mortem investigations on cases of the mixed condition of amœbiasis and infection by the paratyphoid organisms. His cases demonstrate that—

1. Amœbic ulceration of the colon may be present without there being any symptoms of dysentery. It was discovered post mortem in a patient who died from enteric fever due to *B. paratyphosus B* in whom there had been no symptoms of dysentery.

2. Signs of amœbic dysentery may begin in the stage of convalescence after paratyphoid fever.

3. The patient may be admitted to hospital suffering from amœbic dysentery and may develop the additional condition of paratyphoid fever.

Mixed infections of this sort were undoubtedly common; the mortality from them was low so that opportunities for proving the condition post mortem were few.

Bartlett's conclusions are based on post-mortem examinations, macroscopic and microscopic, and on examination of the stools during life. Amœbiasis of the colon may be present without giving rise to any symptoms. It is possible that the symptoms may be begun and kept up by secondary infections such as the paratyphoids.

On the other hand, there is no doubt that the enteric organisms do attack the large intestine. Ulceration of the large intestine in typhoid fever is found post mortem more frequently than is thought. It is stated by many observers, and, in my opinion, correctly, that the paratyphoid organisms are even more prone to select the large intestine for attack.

Torrens and Whittington[2] regard the affinity of *B. paratyphosus B* for the large intestine as a point in differential diagnosis.[3] French observers have noted inflammation and ulceration of the large intestine in paratyphoid fevers A and B.

Dawson and Whittington,[2] in reporting cases of autopsies on paratyphoid patients who died in France, describe 10 cases out of a series of 17 in whom the large intestine was inflamed or ulcerated. The 10 cases were all infections by *B. paratyphosus B.* "In the milder examples the lymphoid nodules were raised, hyperæmic and umbilicated, whereas in the severer forms there were ulcers of varying sizes and depths, the ulceration being most marked in the cæcum and colon as far as the splenic flexure. Notwithstanding the marked distribution of ulcers in the large intestine, it is noteworthy that there were no clinical manifestations of it."

Rathery and his colleagues describe three forms of colitis due to paratyphoid B: (1) Colitis with small ulcers; (2) perforating ulcerative colitis with large deep ulcers; (3) proliferating ulcerative colitis. There are post-mortem findings, and there was apparently no sign of amœbiasis.

As a result of post-mortem evidence it would seem that there can be ulceration of the colon caused by amœbæ or paratyphoid organisms without any symptoms of dysentery having been present; and that dysenteric ulceration may be caused either by amœbæ or by paratyphoids A and B. But it is doubtful whether the question is capable of so simple an answer.

In many cases of paratyphoid dysentery where neither amœbæ nor amœbic cysts have been found in the stools, it is not justifiable to attribute the dysenteric symptoms to paratyphoid organisms alone. These cases may have been amœbic in origin. The evidence of amœbiasis may have disappeared under treatment, or the technical difficulties of finding amœbæ or cysts may have been too great. With improved methods of search amœbic cysts are being found more often than before.

Wenyon and O'Connor[4] state that although amœbic dysentery was rife at Gallipoli during the summer months, bacillary dysentery was more common than is generally thought, and that "there has been a tendency to overestimate the amount of amœbic dysentery on the peninsula during the summer months of 1915, though they recognise that this disease was an important factor in the invaliding of our troops from this section of the Mediterranean."

Rajchman and Western[5] have issued an exhaustive report upon 878 cases of bacillary enteritis received from the Eastern Mediterranean. The patients were in the convalescent stage, but in spite of this the authors have been able to collect most valuable and conclusive evidence. Their results show that the epidemic of dysentery in our Mediterranean force was very complicated. "Both amœbic and bacillary cases existed side by side or actually in the same individual, while a number of cases were not those of dysentery proper so-called, but of paratyphoid fever, of which both varieties A and B were found; but typhoid fever did not play a rôle in the epidemic." Where the bacterial infection was mixed they found that the dysentery bacilli were the originally infecting virus. The two forms of bacillary dysentery (Shiga and Flexner) were found by them in some cases in a pure state, in others they were mixed with other infecting agents, such as the paratyphoid bacilli.

Considering the question in the light of recent work and of clinical observations the following conclusions may be stated:—

1. Paratyphoid fever A and B can begin with symptoms that can justifiably be called dysentery.

2. The paratyphoid organisms, especially A, may be found in the stools of patients who are suffering from dysentery which was originated either by protozoa or the *Bacilli dysenteriæ*.

3. The usually accepted causative agents of dysentery, protozoal and bacillary, may be present in the stools without the patient having had an attack of dysentery.

4. The problem is one practically confined to our forces in the Mediterranean area where multiple infections are common.

Part of the difficulties arise from the vagueness of terms. The word dysentery is only a name, and it is sometimes given by the patient himself to his condition. Once he is labelled with the diagnosis, he may go far through his hospital career before it is found that he is not infected with any of the recognised causes of dysentery but with something else.

Nomenclature is a troublesome matter for the would-be reformer, and I do not put forward my suggestions as perfect; but I should like to see some such classification as this in general use.

When the signs and symptoms point to enteric fever, let the condition be called enteric fever, and the letters T, A, or B added later as laboratory investigations are made.

When the signs and symptoms point to entero-colitis and the cause is not protozoal, the term bacillary entero-colitis could be used. (The abbreviation B.E.C. would be

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* Lecture I. was published in THE LANCET of May 19th, 1917.

[1] Journal of R.A.M.C., 1916, xxvi., Archibald, Hadfield, Logan, Campbell. [2] Loc. cit.

[3] Job et Salvat: Bull. et Mém. de la Soc. Méd. des Hôpit. de Paris, xxxvii., 3 S. Job et Ballet: Ibid., xxxix., 3 S.

[4] Journal of R.A.M.C., xxviii., Nos. 1 and 2, 1917

[5] Medical Research Committee, Special Report Series, No. 5. Report upon 878 Cases of Bacillary Enteritis.

quite at home with V.D.H., I.C.T., &c.) The distinguishing letters S, F, A, B, and T, if it were needed, could be added as the infecting bacillus was discovered.

Cases of Dysentery with Paratyphoid Organisms in Stools.

The following two cases are examples of dysentery, in one of which *B. paratyphosus A* and *B* were found in the stools, and in the other both paratyphoids and *B. dysenteriæ* (Shiga) in addition.

CASE 3.—A. W., inoculated against typhoid four months before; admitted in October, 1915, from Gallipoli. He had been ill for six weeks with dysentery; treated with emetine, bismuth, and castor-oil. On admission T. 101·5 F; he was emaciated, blue, cold, and collapsed, his mind was wandering, and he was moaning and could with difficulty be made to answer questions. Pulse just perceptible; throat and mouth ulcerated and covered with patches of membrane; abdomen retracted, tender and gurgling on palpation; skin covered with cyanotic petechial hæmorrhages. No control over rectum and bladder. There was a constant passage of small quantities of pink mucus with an occasional trace of fæcal matter and much preliminary griping. *B. paratyphosus A* and *B.* both isolated from stools; no agglutination to any member of enteric and dysenteric groups on any examination.

This is a severe but typical example of many cases. As he recovered no further investigation was made. But whether this was originally a case of dysentery with a secondary infection by the paratyphoids cannot be known. It is interesting to note that another man who was admitted at the same time in exactly the same condition was infected with *B. dysenteriæ* (Shiga).

CASE 4.—S. T., inoculated twice against typhoid October, 1914. He went sick in November, 1915, with dysentery, diarrhœa, and passing blood; treated with emetine. Admitted Jan. 8th, 1916; frequent offensive stools with persistent blood; improved for some months, but in April and May was slowly losing ground. May 20th: Examination by sigmoidoscope revealed extreme ulceration; irregular ulcers were seen lying transversely with bridges and islands of mucous membrane, and coming down to within 4 inches of the rectum. June 3rd: Operation. Ileo-sigmoidostomy and enterostomy; definite improvement for a week. June 18th: T. rising; very ill. June 20th: Perforation of ileum 4 inches above artificial ileo-sigmoid junction; general peritonitis; operation; suture; death. There was dysenteric ulceration of colon and ulceration of Peyer's patches of enteric type seen at operation; one ulcer had perforated. No P.M.

In this case there was bacteriological evidence of bacillary dysentery and of both paratyphoids. Pathologically there was ulceration of the colon, and ulceration of Peyer's patches. That is, there was a double infection, and evidence of two kinds of disease of the intestinal tract. To what extent, if any, these pathogenic organisms interacted is a matter for speculation.

From the purely clinical point of view the matter is not so complex. The patients have dysentery and they have paratyphoid organisms in their stools. Both the symptoms and the organisms have to be overcome.

There are no particular clinical features about these patients with paratyphoid dysentery. There are pain, tenesmus, and straining; the passage of blood and mucus; the extreme weakness and emaciation that are seen in all severe forms of dysentery.

The stools in amœbic dysentery consist of dark blood and mucus rather than of bright red blood and pink mucus. In bacillary dysentery the blood is brighter and is in streaks in the mucus, or the mucus is pink. In this form there is often a history of an initial fæcal diarrhœa which empties the intestine and is succeeded by the passage of blood and mucus. I mention these points with reserve, for my experience of dysenteric stools is not sufficiently extensive to justify a dogmatic statement.

In these cases of paratyphoid dysentery there are occasionally symptoms, as in the last case quoted, that indicate a more definite and specific infection by the paratyphoid bacilli, such as an exacerbation of the illness accompanied by a rise of temperature, headache, a crop of spots, and an enlarged spleen; in other cases jaundice has supervened.

Progress with these patients is very slow, and it is difficult to establish control over the sphincter and to obtain regularity of the bowels. Temporary relapses of a minor character are very common and may be brought on by a sudden change of the weather, particularly a cold east wind, and by indiscretions of diet.

A troublesome feature in some cases has been an intermittent spasm of the sigmoid. The patient is conscious of the periodic formation of a painful tender lump in the left iliac fossa which can be felt as a sausage-shaped tumour. Examination with the sigmoidoscope reveals the spasm very clearly.

III. THE BILIARY TYPE.

According to some observers, the infection of the bile-passages and gall-bladder by paratyphoid organisms has been very frequent; according to others it has been rare.

Thus Sarrailhé and Clunet[6] write of the frequency of camp jaundice at Gallipoli. They isolated from the blood a particular strain of paratyphoid organism which was present at the time of the incidence of the jaundice. This organism failed to give definite reactions with specific sera and was therefore not classified. They named it provisionally paratyphoid D (Dardanellensis), and it has since been proved in a large majority of the cases to be paratyphoid A.

This jaundice began to be prevalent in the middle of August. It occurred "among tired troops confined for several weeks in a restricted space and tried by imperfect feeding and unfavourable climatic conditions." Jaundice occurred either as a sequel to a febrile gastric derangement or as a feature of a febrile attack. In the latter there was great weakness, loss of appetite; there was no itching of the skin; convalescence was prolonged.

Jaundice was very prevalent at one time at Gallipoli, and some of the patients did not feel ill enough to report sick. These were to be seen working with the appearance of jaundice well marked, as has been reported by Dudgeon.[7] Rathery, however, comments on the rarity of jaundice and biliary complications among the 1088 patients in his series of *paratyphoid B. infections* occurring in Flanders.[8]

Among the cases of my series jaundice of the catarrhal type has been seen—

1. Quite early in the illness; more often it appears after a period of malaise. It resembles a simple catarrhal jaundice in character and is seldom severe or troublesome.

2. It can appear later in the illness; it has been seen on several occasions during the unsatisfactory stage of convalescence when the temperature is not steady. It is of the catarrhal type in these cases, but is rather more severe and lasting in the latter.

3. It has a tendency to become recurrent. After the patient has had a mild attack of jaundice and has quite recovered and been in good health for months the jaundice may return and be much more severe than in the original attack.

CASE 5.—An officer, in Gallipoli from start to finish, was never really ill there, but had indigestion, slight jaundice, and dysentery. A year later, in France, he was suddenly taken ill with gastric discomfort and vomiting; jaundice set in and became very deep. Liver and spleen enlarged; occasionally slight tenderness over gall-bladder region; great itching of skin and recurrent attacks of urticaria; P. 63, *B. paratyphosus A* in stools. Jaundice lasted 10 weeks, but patient was feeling quite well long before colour had disappeared from skin.

Cholecystitis may occur and may be accompanied or not by jaundice.

Several cases of acute cholecystitis without jaundice have been seen. In most of those that I have seen there has been a transitory tinge of the conjunctivæ and a darkening of the urine, sufficient for the patient to notice it. Acute cholecystitis with severe jaundice has also been noticed, but in some of the cases there was an empyema of the gall-bladder.

Morley and Battinson Smith[8] have described an unusual case of acute gangrenous cholecystitis with spreading peritonitis occurring in the epidemic of jaundice in Gallipoli. Campbell isolated *B. paratyphosus B* from the bile and stools of this patient.

The following case throws an interesting light on the possible sequels of paratyphoid infections of the biliary tract.

CASE 6.—Army pensioner admitted to hospital for recurrent attacks of pain and jaundice; had very severe attack of enteric fever in Boer War. In 1904 two attacks of colic and jaundice. He was free from attacks for 11 years from 1904 to 1915. From August, 1915, to April, 1916, he had 12 attacks beginning with shivering, vomiting, and pain of varying intensity. The stools at once became light in colour and the urine dark. The jaundice lasted 4 to 14 days. Edge of liver palpable and gall-bladder just felt. At operation gall-bladder was found to be inflamed, adherent, and friable; it contained a few gall-stones. *B. paratyphosus B* isolated from bile.

This case and the previous one illustrate two different clinical forms of jaundice occurring late in the course of a paratyphoid infection; for it is reasonable to infer that in the first case the paratyphoid infection occurred at Gallipoli and in the second in South Africa.

In their investigation into jaundice of infective origin in France, Dawson and Hume[9] report 26 cases of the enteric group, of which 6 were due to typhoid, 14 to paratyphoid B, 4 to paratyphoid A, 1 to a double infection of paratyphoid A and B, and 1 to an undetermined infection of the enteric group. One of these cases was fatal from acute pneumonia.

In their post-mortem reports Dawson and Whittington obtained paratyphoid bacilli from the gall-bladder on 14 occasions—13 B and 1 A. In 1 case there was increasing

[6] Sarrailhé et Clunet: Bullet. Mém. de Soc. Méd. des Hôpitaux de Paris, xl., 3 S., 1916, and THE LANCET, March 25th, 1916.
[7] Dudgeon: Proc. R. Soc. Med., ix., No. 6.
[8] Brit. Med. Jour., March 25th, 1916.
[9] Dawson and Hume: Quart. Jour. Medicine, x., Nos. 37 and 38.

jaundice during life, and abscesses of the liver were found post mortem. In 2 cases purulent fluid was found in the gall-bladder, but in neither case was there jaundice during life.

There is no doubt that the paratyphoid organisms frequently invade the biliary system, but do not so frequently cause jaundice at the time; but there is a considerable danger of chronic cholecystitis with the formation of gall-stones being found months or years afterwards, and there is a great danger that the gall-bladder may become a reservoir of infected bile which is periodically discharged into the intestine.

IV. NEPHRITIS AND OTHER AFFECTIONS OF THE URINARY TRACT.

Albuminuria is commonly present for a few days at the height of the fever, but this hardly needs comment. But there is a very great tendency for the paratyphoid organisms to find their way into the urinary tract. In several cases the organisms can be found in the urine both in the acute stage and afterwards for a varying length of time without there being any evidence of infection of the urinary tract.

Nephritis.

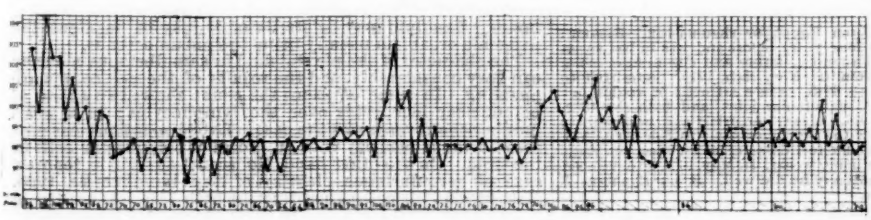
Acute nephritis is fairly common; it was present in 4 per cent. of my cases. It was most commonly found in the period when "trench nephritis" was so prevalent. Possibly this figure is too low. The patients were admitted with the diagnosis of nephritis, and the paratyphoid infection was discovered later. Possibly some cases escaped detection.

There is nothing peculiar to the nephritis of paratyphoid. The cases differ in type and degree of severity in exactly the same manner as in other infective inflammations of the kidney. The results are also similar. The mild cases make an apparently good recovery, though their convalescence and period of symptoms is prolonged. The severe forms commonly pass into a chronic condition with permanent cardio-vascular changes and have to be invalided out of the service or put into the sedentary class. Whenever there was a history of previous renal disease the progress was more slow and the result unsatisfactory, and, broadly stated, men over 35 years were unfit for full service again, even if their progress had been good.

A curious condition was noticed on several occasions. Patients were admitted bearing the yellow label of "nephritis." The face, eyelids, and ankles were swollen and had been in that state for a few days. The urine was normal as regards quantity and absence of albumin. Several of these patients had paratyphoid A or B in their stools. In some of them it was noticed that the cardiac area was enlarged, the apex beat displaced outwards, and the cardiac action rapid, especially on examination. Their progress was uneventful and they were soon free of symptoms.

Moorhead[10] reports that in 5 per cent. of his cases there was retention of urine at the onset of the disease.

CHART 6 (Case 7).



Enteric fever, paratyphoid B. Prolonged irregular temperature, with two recrudescences. Acute nephritis.

The following is an example of a severe case of acute nephritis (paratyphoid B).

CASE 7.—W. D., aged 22, admitted from France, Dec. 4th, 1915, as nephritis. History: Ill four weeks; began with swelling of face; passed a lot of water at first; no headache, no sickness, no sore throat; bowels not properly open. Condition: Flushed, dry skin; tongue white; T. 103° F. (Chart 6); P. 84, dicrotic; spleen palpable; a few rose-red spots on abdomen; basal bronchitis. Urine 18 oz. in 24 hours; dark and smoky, with a brown sediment. Reaction neutral, albumin ¼; blood cells, blood casts, and epithelial casts. Treatment: Urotropine gr. x. t.d.s. Dec. 18th and Jan. 24th: Albumin a trace, pus cells, and casts. Feb. 17th: Albumin a cloud, no casts. Feb. 26th: No albumin, no casts. Brachial blood pressure, 116 mm. Hg. Bacteriological examinations: Dec. 8th, agglutination +++ to paratyphoid B; paratyphoid B isolated from stools Dec. 15th; from urine Jan. 7th, and similar results on other dates.

Progress.—The temperature came down by lysis, and though not steady was not above 99° for three weeks; then there was a recrudescence lasting six days, and one week later another recrudescence of milder character, after which progress was uninterrupted. The relapses were of the enteric type, and the urine was not affected. On discharge he was passing 50–60 oz. of normal urine per diem.

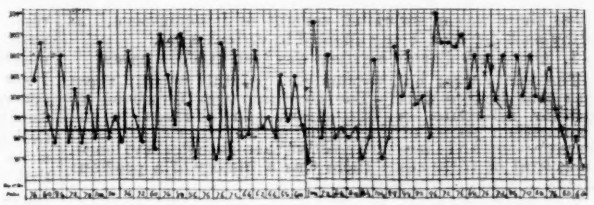
This case may be regarded as one of paratyphoid fever in which the first onslaught was felt mostly by the kidneys. As time went on the "enteric" character of the disease became more definite, and as the "enteric" relapses occurred there was no further inflammation of the kidneys.

The following case is one with vascular-renal changes.

CASE 8.—J. S., aged 40, admitted for nephritis. History: Eight weeks before had been very wet and felt generally ill afterwards. Two weeks later he got very wet again. Swelling of face, legs, and stomach noticed soon after; headache very bad. Urine almost solid with albumin; blood present in large quantity; epithelial casts. Brachial blood pressure 154 mm. Hg. Three months later albuminuric retinitis was discovered. *B. paratyphosus B* isolated from stools on several occasions.

In this case there was probably some vascular-renal deficiency of long standing. There was no "enteric" feature in the disease. It might be argued that this was a case of chronic nephritis with an accidental contamination of the stools that had nothing to do with the renal condition, but I should prefer to regard it as a case of imperfect kidneys made worse by a microbic infection.

CHART 7 (Case 9).



Enteric fever, paratyphoid A infection. Acute nephritis. Prolonged irregular temperature with some morning rises and evening falls.

The following case presents several points of interest:—

CASE 9.—H. F., aged 30, admitted April 4th, 1916, from Egypt for nephritis. History: Illness began in February with headaches, swelling of legs and feet, and fever. Temperature raised on the boat. Condition: Intense headache and photophobia; muscular twitchings; breath urinous; great emaciation. T. 102·2°, P. 76. Partial incontinence. Urine very scanty; half albumin. After two days he passed 100 oz. of urine containing a trace of albumin; this condition persisted. Rose-red spots, enlarged spleen, high temperature with inverted remissions, and slow pulse made the diagnosis of enteric fever definite. (Chart 7.) Bacteriological examinations April 7th: *B. paratyphosus A* in stools; urine sterile. He ultimately made a good recovery and on discharge was passing 70 oz. of urine free from albumin.

His condition on admission was very grave; it is difficult to say how much of it was uræmic and how much the typhoid state. It seemed to be a mixture of both conditions.

But the greater number of these patients have milder conditions. There is usually swelling of the face and legs, a small quantity of albumin in the urine, blood cells and a few epithelial casts. Isolation of paratyphoid organisms from the urine is infrequent, but the presence of the organisms in the stools and the agglutination reaction will decide the nature of the infection.

The symptoms are usually very obstinate, headache, backache, and morning puffiness of the eyes lasting a long time even after the urine is free from albumin. The majority of the younger men return to duty of some sort, but not many are fit for the trenches until they have been under care and observation for a long time.

Other urinary infections are as follows:—

Pyelitis occurs occasionally and pyonephrosis caused by *B. paratyphosus B* was seen in two cases.

Worster-Drought and Kennedy[11] have described an interesting case of acute urinary infection with paratyphoid B. There were acute vesical symptoms and pyuria. There were no signs nor symptoms of any infection of the alimentary canal.

[10] Moorhead: Med. Press and Circular, 1916.

[11] Brit. Med. Jour., May 6th, 1916.

Cystitis is one of the commonest and most lasting of the later troubles. It may occur with pyelitis or without it. At first there is pyuria and the passage of urine containing the paratyphoid organism. Later the *Bacillus coli* appears and swamps the paratyphoid bacillus. Such patients may become very obstinate and dangerous carriers.

The urinary tract seems to be very vulnerable to the paratyphoid infections, especially to *B. paratyphosus B*. It is seldom that it is possible to speak warmly about the properties of a drug, but in these infections the benefits obtained from urotropine are very striking. It is my opinion that a routine use of urotropine would be found beneficial in all paratyphoid fevers, both for prevention and cure of urinary infections.

V. THE "RHEUMATIC" TYPE.

I am using the term "rheumatism" in the popular sense, and not according to strict medical terminology. In popular usage "rheumatism" will describe all forms of inflamed painful joints and muscles.

Apart from the aching backs and legs of which so many paratyphoid patients complain, there are a number of conditions to which the term "rheumatism" can be applied. Articular rheumatism has been observed by several writers. Nobécourt and Peyre[12] say that it is a common feature in paratyphoid fevers, especially in paratyphoid B. Wiltshire has drawn attention to arthralgia and myalgia. Among my cases there was a surprising amount of "rheumatism," as many as 8 per cent. being affected in various ways.

1. Acute articular rheumatism was seen in a few cases.

The joints were hot, swollen, and painful; usually there was considerable fluid. The condition was improved by sodium salicylate in full doses. In addition to the rheumatism some of the signs of an enteric infection were present, and there was positive bacteriological evidence. In several of these cases there was a history of a previous attack of acute rheumatism.

2. A condition more closely resembling the "infective" type of arthritis was commoner.

In more than one case the suspicion of gonorrhœa was entertained before it was disproved and the presence of a paratyphoid organism discovered. In these cases the knee-joints were particularly affected. There were heat, swelling, and pain in the joints. The swelling was synovial and in the neighbouring tendons and other periarticular tissues. It was accompanied by great wasting of muscles. The results were unsatisfactory; partial ankylosis occurred in two cases, and in others the joint had to be very gently treated for a long time. There was a great tendency for the joints to swell again with the least strain on them.

Many of these joints had previously been damaged at foot-ball and they became acutely inflamed during paratyphoid fever.

In others the patients came under observation on account of their joints and were found to be infected with paratyphoid organisms.

The following two cases are illustrations of these two conditions. Also both suffered from acute iritis in the later stages of the disease.

CASE 10.—L. H., admitted from Egypt for rheumatism. History: He had swollen painful joints four years before and was in bed seven weeks. Rheumatism is in the family, father and one brother being subjects. He landed at Alexandria Nov. 15th, 1915. Admitted to hospital for dysentery Dec. 25th, 1915. Acute arthritis of ankles, left knee, left wrist, left temporo-mandibular joint, and both shoulder-joints set in on Jan. 7th, 1916. A large arthritic and periarthritic effusion developed in and about the right knee early in February, 1916. The other joints cleared up under full doses of salicylates, but right knee remained *in statu quo* for many weeks. In May, 1916, he developed acute iritis of left eye. Eventually he did well. *B. paratyphosus B* repeatedly isolated from stools.

CASE 11.—J. B., admitted from Mediterranean for bronchitis and emphysema. On admission both knee-joints swollen and painful; swelling fusiform. Fluid in joints and tissues above and below joint. Later he developed double conjunctivitis and iritis. He did not respond to salicylates. *B. paratyphosus A* repeatedly isolated from stools.

3. There is a group of cases which, for want of a better term, I have called the "trench-fever type." This group can for convenience be described under the heading of "rheumatism."

Before there were such complete and detailed accounts of "trench fever" I had noted that occasionally painful, tender shins, worse at night, were symptoms of a mild type of paratyphoid fever. The onset in these cases was sudden; the temperature was usually not as high as 103° F. They were not seen at all frequently until April, 1916. They came into hospital with the diagnosis of "trench fever," and they closely resemble it. They were found bacteriologically to be paratyphoids. On the other hand, the majority of the "trench fever" patients gave no bacteriological evidence of being paratyphoids. The following cases are examples:—

CASE 12.—J. P., admitted June 15th, 1916. Labelled "typical trench fever, T. 102 4°." Inoculations: typhoid, two, October, 1914; T.A.B., two, May, 1916. History: On June 1st sudden onset of shivering, headache and legs aching. Temperature, June 15th, normal; shins still tender and painful at night. *B. paratyphosus B* repeatedly isolated from stools.

CASE 13.—W. S., admitted as trench fever May 24th, 1916. In hospital since April 17th. Has fever every five days; aching shins very bad at night. *B. paratyphosus B* isolated from stools.

CASE 14.—F. C. S. admitted as "trench fever" August 27th, 1916. Inoculations: Typhoid, two, June, 1915; T.A.P. two, April, 1916. History: Went sick two weeks before; had fainted twice on the march. He complained of pain in back and legs and bad headache. Condition: T. 102·2°, P. 100; tongue dry, shins very tender; internal saphenous veins thrombosed over the malleolus; abdomen firm; some possible spots, fading; drowsy. *B. paratyphosus A* isolated from stools.

The last case was more definitely of a clinically enteric type. I quote these cases to show that the syndrome of trench fever may be associated with a paratyphoid infection. Though relatively only a few cases of trench fever will yield evidence of paratyphoid infection, it is important to exclude paratyphoid in the cases which present the "trench fever" group of symptoms. For there is evidence to show that the two diseases can easily be confused, and it takes time and repeated examinations to distinguish them. This type of paratyphoid fever did not come under my notice in the early months of the war, nor did I see any in cases from Gallipoli. I am at a loss to explain why this should appear in the spring of 1916 and after. The number of cases is too limited for any theory to be put forward, but it is worthy of note that the nature of paratyphoid fever has changed entirely since the triple vaccination became general. Further than that it is impossible to go.

VI. DISEASES OF THE RESPIRATORY TRACT, BRONCHITIS, PLEURISY, AND PNEUMONIA.

Infections of the respiratory tract are common. In fact, Labbé regards them as the only complications that are specific to paratyphoid fever.

Bronchitis is very commonly present.

Usually it is only a mild condition, but there may be general bronchitis of a severe type. Minet[13] describes 8 cases of severe bronchitis occurring as the first evidence of the disease; of these 6 were paratyphoid B and 2 were paratyphoid A. Other observers have made similar records.

The onset in these cases is sudden, often with a rigor, and the patient is more ill than the physical signs in the chest would indicate. In a few days the clinical features of enteric fever and the bacteriological tests will settle the diagnosis.

Pleurisy is far from uncommon in paratyphoid fever.

It may be quite trivial and pass away in a few days or it may be the starting-point or accompaniment of pneumonia. A very acute pleuro-pneumonia may follow rapidly on a pleural friction, or a collection of fluid may appear in a few hours. The fluid may be sterile or it may be purulent, the pyogenic organism usually being the pneumococcus.

The character of the pleural fluid in sero-fibrinous pleurisy can vary considerably, and the results of the cell counts are puzzling. In some effusions the count showed an excess of polynuclear leucocytes over the lymphocytes; in a small number the reverse was the case. Labbé mentions cases of sero-fibrinous pleurisy with an excess of polynuclear cells in the fluid. On the other hand, Nobécourt and Peyre report a case of sero-fibrinous pleurisy of the lymphocytic type. Rathery and his colleagues describe both varieties occurring in paratyphoid B fever, but in their one case of lymphocytic pleural effusion there was a history of death from tuberculous meningitis 7½ months later.

When organisms are isolated from the pleural fluid they are found to be of the pyogenic varieties, most commonly the pneumococcus, and the effusion becomes purulent.

The two cases described below illustrate the features of the lymphocytic pleural effusions. The relationship between paratyphoid infections and possible tuberculosis will be considered later.

CASE 15.—A.S., admitted for pneumonia. The illness started with a rigor. On admission pleural friction with impaired resonance and diminished breath sounds at right base and axilla. In 48 hours signs of fluid very definite and heart displaced outwards. Clear fluid was withdrawn by aspiration, which was sterile and showed a large excess of lymphocytes. *B. paratyphosus B* repeatedly isolated from stools.

[12] Nobécourt et Peyre: Bull. et Mém. de Soc. Méd. des Hôpitaux de Paris, 1916, III. S., xl.

[13] Minet: Bull. et Mém. de Soc. Méd. des Hôpitaux de Paris, 1915, III. S., xxxix.

There was nothing in the history, the signs, or the subsequent course to suggest the presence of tuberculosis.

CASE 16.—E. R., admitted for dysentery, from which he was convalescent. The day before admission he had pain in right side and shivering. He was cold, blue, and collapsed. The signs were those of pleurisy and consolidation of right lowest lobe. In three days there was a large effusion which was aspirated then and on three subsequent occasions. He ultimately did well.

The fluid on all occasions was clear, sterile, and showed an excess of lymphocytes. No tubercle bacilli found in sputum but radiogram showed opaque glands at roots of lungs with radiating bands of fibrous tissue in lung. *B. paratyphosus A* present in stools.

As has been mentioned, a pneumococcal empyema may occur during paratyphoid fever. The following case is an example, and it further illustrates a condition of partial consolidation of the upper lobe, which gives rise to signs similar to those of pulmonary tuberculosis.

CASE 17.—C. B., admitted with diagnosis "pulmonary tuberculosis." Illness began in France with broncho-pneumonia Feb. 25th, 1916. Admitted March 16th, 1916. The signs were those of dry pleurisy over right lowest lobe. Upper lobes on both sides, back and front, presented signs suggestive of pulmonary tuberculosis. Percussion note impaired; tactile vocal fremitus increased; breath sounds high-pitched, with lengthened expiration; vocal resonance increased in pitch and intensity, and whispered voice was conducted outside bronchial area. In addition fine râles heard both front and back. A pneumococcal empyema developed and was treated surgically. Several small crops of spots occurred at different times; spleen palpable. *B. paratyphosus A* and *B* isolated from stools.

Repeated examinations of the sputum for tubercle bacilli were negative. After the empyema had been drained the signs in the upper lobes passed off and on discharge it was impossible to detect anything abnormal. He left the hospital looking the picture of health.

Lobar and *broncho-pneumonia* are seen in paratyphoid fever.

They are seen either as the initial condition or occurring at any time in the course of the disease. In any case the occurrence of pneumonia is a very serious feature, and the prognosis is bad. There is a tendency for broncho-pneumonia to be of the "creeping" variety. As one consolidated area begins to resolve a neighbouring unaffected area becomes solid. In some of these cases hyperpyrexia has been seen and commonly very excessive sweating occurs.

In a case recently seen left basal pleuro-pneumonia began with a rigor and an attack of diarrhœa. Gradually, catarrhal signs and signs of consolidation spread over both lungs. After eight days diarrhœa started again; spots of the paratyphoid variety came out on the abdomen, and the spleen was palpable. The temperature was above 104° F. for two weeks, and gradually rose to 107°, when the patient died.

The paratyphoid bacilli apparently do not attack the lungs and pleura themselves. Labbé, however, mentions a case of abscess of the lung, from the pus of which *B. paratyphosus B* was isolated. Apart from this rather special case, I cannot find a recorded instance of paratyphoid bacilli being found in pleural fluid ante mortem, nor in the lungs post mortem. I can only think that if these organisms do attack the lungs and pleura it must be but rarely.

It is interesting to note that many patients suffering from wounds of the chest and hæmothorax became infected with paratyphoid organisms. These wounds were important predisposing factors.

The relationship of paratyphoid infections to *tuberculosis* has been mentioned in the descriptions of the last three cases.

If a lymphocytic pleural effusion is to be regarded as a sign of tuberculosis and of nothing else, it would appear from the consideration of my cases and those described by others, that the power of paratyphoid infections to activate latent tuberculosis is great. Rathery's one case in which a fatal termination was due to tuberculous meningitis is very suggestive.

In the second of my cases described I have a strong suspicion that there was underlying tuberculosis. In the other case, however, there was no indication of tuberculosis. I am, however, inclined to the opinion that the lymphocytic effusions which have been seen in paratyphoid affections are really evidence of tuberculosis stirred to activity by the paratyphoid infection.

Pulmonary tuberculosis may reveal itself during the acute stage of paratyphoid fever. More commonly it occurs during the stage of convalescence. In such patients there may be a history of some former chest trouble which would cause a suspicion of tuberculosis.

On the other hand, there may be well-grounded suspicion of pulmonary tuberculosis, which events fail to prove, as in the case of empyema just quoted. In that case I was convinced for some days that there was pulmonary tuberculosis, but eventually the diagnosis had to be given up. I learn with interest that Rathery and his colleagues had difficulties of the same kind, and in the end gave up the diagnosis of pulmonary tuberculosis on the signs found in the upper lobes in these cases.

The paratyphoid organisms can also rouse latent tuberculosis in other parts of the body. During convalescence from a mild attack of paratyphoid A fever one patient developed a rapidly progressive tuberculous peritonitis, which was arrested only after prolonged treatment.

VII. THE INFLUENZAL TYPE.

Influenza and paratyphoid fever have much in common. Not only do both diseases appear in divers forms, but paratyphoid fever can imitate the forms of influenza so closely that at the onset of the fever it may be impossible to distinguish between the two conditions. Later, in the course of paratyphoid fever, we may expect to find some of the signs that point to an enteric infection, but they do not always appear, and the diagnosis is made by the bacteriologist on nothing more than the suspicions of the clinician.

Paratyphoid fever may simulate three different forms of influenza.

1. *Respiratory form.*—The onset is sudden with rhinitis, pharyngitis, and often laryngitis. The catarrhal condition may travel downwards and affect the trachea and bronchi. There is a moderate amount of fever and a slow pulse; frequently there is copious sweating. Towards the end of the first week more definite indications of enteric fever may be present. Stolkind lays stress on the prevalence of this form of infection, and undoubtedly there are plenty of examples to be seen.

2. *The gastro-intestinal form.*—In this variety the onset is sudden and accompanied by nausea, vomiting, abdominal pain, and diarrhœa. The condition of the patient may be very serious and fatal cases are reported. In time the characteristics of enteric fever may appear and the real cause of the condition can be investigated. Post-mortem examinations in such cases have revealed an intense gastro-intestinal inflammation without ulceration of lymphatic tissue.

3. *The nervous influenzal form* also occurs but is uncommon. As in the others, the onset is sudden with intense headache, irritability, and depression. In one patient who began with these symptoms, paratyphoid A and B organisms were found in the stools. Later he had a relapse which was purely of the enteric fever type.

These influenzal conditions are not likely to be suspected of being paratyphoid conditions, unless there are a good many known paratyphoid patients under observation at the same time. An individual case of this kind would probably escape detection unless the symptoms became very suggestive of enteric fever. But when one hears of small epidemics of gastro-intestinal influenza occurring in a town the suspicion should always arise concerning the nature of the infection, and it is highly desirable that paratyphoid infections should be proved or excluded. Most important of all, the manner of the origin and spread of the infection should be determined.

VIII. THE SEPTICÆMIC TYPE.

There is little to be said of this type.

It is seen most commonly in patients who die early in the disease. Post mortem no local lesions are found, but only the signs of an acute septicæmia. In some of the most virulent cases gangrene of the extremities sets in and progresses rapidly until the patient dies.

Job and Ballet describe three cases of death from paratyphoid fever (2 A, 1 B), in which the post-mortem findings were not distinctive of anything but septicæmia. Sawasaki also describes similar cases occurring in Japan.

VARIED CLINICAL MANIFESTATIONS OF PARATYPHOID INFECTIONS.

This concludes my description of the various clinical types of paratyphoid fever. It would not be difficult to add other varieties, and if, as is probable, I have omitted some forms that have occurred in the experience of other observers, I wish it to be remembered that this account, faulty and inadequate as it is, is only the account of what I personally have seen. It can be added later to the accounts given by others to help in making up the sum total of our clinical knowledge of paratyphoid fever.

It is obvious that the paratyphoid organisms can be protean in their clinical appearances. Paratyphoid fever may be regarded as a great imitator of other diseases. It may be like typhoid fever, like dysentery, like influenza, &c. But that is hardly the logical way of looking at it. It can cause infections and inflammations of so many systems of the

body that it is bound to resemble at one time this, and at another time another infective disease which we have come to regard as having a special morbid affinity for a particular system of the body.

Further, it has the quality in certain individuals of being able to call into activity diseases which were lying latent. Thus examples of rheumatic fever in the rheumatic subject, consumption in the patient who has arrested tuberculosis can be found in plenty. The relationship to malaria is peculiarly close. It is well known that any pyrexial condition occurring in the malarial subject will make the patient behave in the malarial fashion to a certain extent. But paratyphoid fever will bring on an attack that is malarial exactly. Further, the manner of onset in some cases of paratyphoid fever is very difficult to distinguish at first from malaria on clinical grounds.

There is a danger, that is clear to all, in such an examination as this that an obsession of paratyphoid infection might occupy the mind to the exclusion of all sense of proportion. I trust that I have steered clear of this danger in describing these forms of paratyphoid infections. But I do wish to emphasise my opinion that the infections by paratyphoid organisms are very widespread and may take a very great number of forms. It is not necessary to suspect paratyphoid fever in every case of unexplained pyrexia unless there are some definite clinical reasons for doing so. On the other hand, it is obvious that the question of paratyphoid infections will have to be considered much more seriously in the future than in the past, when epidemics of influenza and gastro-intestinal catarrh occur.

The infectivity of paratyphoid fever is very great and the amount of infecting material will certainly increase. It will be necessary for the strictest hygienic rules to be enforced in dealing with known cases, but as all the infective cases cannot possibly be known it is incumbent upon the community to protect itself by inoculation. But I can refer to this subject more conveniently later.

THE LEUCOCYTES IN CASES OF IRRITABLE HEART.

BY GRACE BRISCOE, M.B., B.S. LOND.

(A Report to the Medical Research Committee.)

THIS investigation was undertaken with the object of determining what changes, if any, are present in the white blood cells in cases of "irritable heart." All the patients investigated were soldiers admitted to the Mount Vernon Military Hospital suffering from the symptoms associated with the above condition—viz., breathlessness or palpitation on slight exertion, faintness, giddiness, præcordial pain, and general lassitude. Preliminary counts had shown that in some cases the number of non-granular cells in the capillary blood was considerably greater than normal both absolutely and relatively to the granular cells. Further investigation was undertaken to decide if this change was constant, and if it could be regarded as of value in diagnosis and prognosis.

The blood was obtained from the ear. The lobe of the ear was washed in absolute alcohol, the first drop of blood wiped away, the second drop which oozed out was used to make the film for the differential count. Blood was then taken for the total leucocyte count, Thoma's hæmocytometer being used. Acetic acid 0·5 per cent. with methyl green was employed as a diluent. An average of 400 to 500 cells was counted. For the differential count dried films were stained either by Leishman's or Giemsa's methods. A wet method described in the addendum was also employed.

The differential count.—The classification given by Cabot in Osler and McCrae's "System of Medicine," 1915, was followed. Granular cells: 1. Finely granular neutrophil cells or polymorphonuclears. 2. Coarsely granular cells or eosinophils. 3. Basophils or mast cells. Non-granular cells: 4. Lymphocytes. The large and small forms were counted separately, but in the tables only the total numbers of lymphocytes are given. 5. Large mononuclear cells.

There was some difficulty in distinguishing between the last two classes. The first counts from these patients showed a large number of cells which possessed a deeply indented nucleus, but the protoplasm was not relatively abundant, and "azur granules" were present in many cases. These cells amounted at times to more than half the total number of non-granular cells, and seemed to form a transitional class between the large lymphocytes and the large mononuclear or "hyaline" cells. The rule was adopted of classifying such cells among the lymphocytes, even if the nucleus was deeply indented, unless the nucleus occupied an area less than half of the cell. With this method of classification the count of large mononuclear cells fell in nearly every case within normal limits (1–4 per cent). In the wet counting method the large mononuclears are easily distinguished from the lymphocytes, and the parallel counts in dry and wet films showed approximately the same percentages.

(b) The margin of error.—The probable margin of error in the differential count is noticed further in the addendum. The importance of this will be seen later when the question of diagnosis is discussed. In a differential count of 400 cells the probable margin of error is considered to be 4 per cent. For the purpose of diagnosis a rise or fall of more than 8 per cent. in the lymphocyte count (400 cells counted) in blood taken at different times is considered to be outside the probable margin of error, and to indicate a real change in the proportions of the white cells circulating in the peripheral blood.

Comparison of variability of total and differential counts in cases of "irritable heart" with those of controls.—(a) *Total leucocyte counts.*—The total number of leucocytes in these cases is considerably higher than in normal individuals.

Ninety-three counts were carried out on 34 patients and 32 counts on 9 controls. The controls consisted of 3 medical men, 3 patients who had been sent to the hospital, but did not show any symptoms of "irritable heart," and 3 women. The times at which the counts were made were approximately the same, both in the case of patients and controls—viz., between 10 and 12 in the morning. Counts taken immediately after exercise are included in both sets.

Table I. is a general statement of all the counts made in patients and controls. The figure in each division of Column A represents the number of total counts which fell within certain limits, the letters in Column B the patients or controls on whom these counts were carried out, each letter representing a patient or control—e.g., of the counts which fell between 17,000 and 18,000 per c.mm., two were carried out on Patient I and one each on Patients M and R.

TABLE I.—*Total Leucocyte Counts.*

Cells per c.mm	Patients.		Controls.	
	Col. A.—No. of counts.	Col. B.—No. of patients.	Col. A.—No. of counts.	Col. B.—No. of individuals.
5,000	—	—	5	n,q,www.
6,000	4	P.T.T,l.	6	n,qqq,s,w.
7,000	6	S S, T,P,b,l.	7	n,o,p,r,s,ww.
8,000	7	C,D,G,I,T,X,e.	12	mm,oo,pp,rr,s,v, ww.
9,000	13	EE,H,N,O,O,O,T,UU, L.S.d.	1	q.
10,000	14	B.G.I I,P.R.T,H.Q Q, a g,j j.	1	m.
11,000	7	A,N.H,O,O,U,g.	—	—
12,000	8	I I,Q,T,Y,J,Z,c.	—	—
13,000	7	L.K,N.Z,c.L.L.	—	—
14,000	6	H,T.K,M,W,f.	—	—
15,000	4	H.U,cc.	—	—
16,000	6	B,H.J.L,W W	—	—
17,000	4	I I,M.R,	—	—
18,000	4	G.M.T, c.	—	—
19,000	—	—	—	—
20,000	2	R, K	—	—
21,000	—	—	—	—
22,000	—	—	—	—
23,000	1	J	—	—
24,000	—	—	—	—
—	93 counts.	34 patients.	32 counts.	9 individuals.

The average total count of the patients was 12,100 cells per c.mm. (lowest 6800, highest 23,800). The average of the controls was 7400 per c.mm. (lowest 5000, highest 10,040).

The degree of leucocytosis in these patients appears to be directly proportional to the amount of exercise taken before the count is made, other factors, such as food, being the same. Of 38 counts made while the patient was in bed or after he had been lying on his bed for an hour, the average was 10,600 per c.mm. (lowest 6800, highest 16,800). Of 31 counts on these patients walking about in the ordinary way, the average was 12,700 per c.mm. (lowest 7100, highest 18,200). Of 17 counts made immediately after a staircase exercise, the average was 15,000 per c.mm. (lowest 8700, highest 23,800). In 7 controls the average count after rest was 7100 per c.mm. (lowest 5700, highest 8400); the average after a staircase exercise was 8200 per c.mm. (lowest 6200, highest 10,040).

(b) *The differential count.*—The diurnal variation of the leucocytes, even in normal individuals, is considerable. It has been ascribed to such factors as fatigue, exercise, food, &c. The time of day, therefore, at which a differential count is made becomes important.

Four-hourly differential counts showed that the diurnal variation in cases of "irritable heart" is greater than in normal individuals and that a high lymphocyte count is very common. Differences of over 20 per cent. in the lymphocyte counts in the four-hourly intervals were frequently met with. Table II. is a general statement of the polynuclear percentages in the differential counts made on the first 50 patients examined and of 73 counts on 12 controls. The controls were 4 medical men, 4 soldier patients with no symptoms of "irritable heart," and 4 women. All the counts are given irrespective of time, exercise, or food, both in the case of patients and controls.

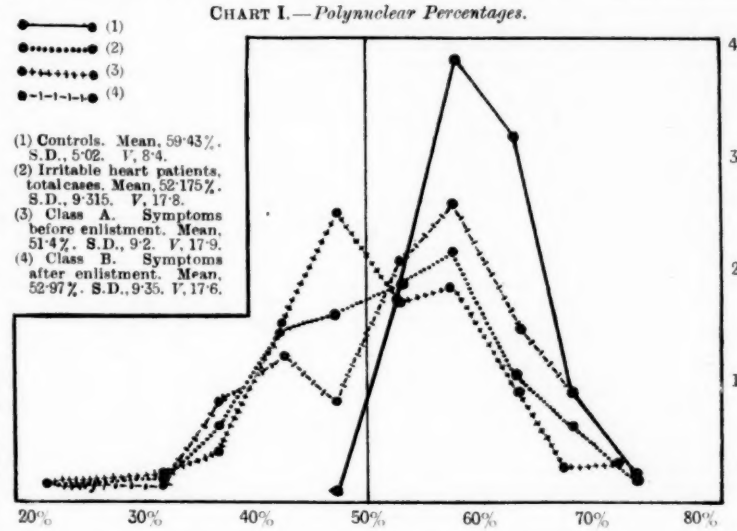
TABLE II.—*Numbers of Polynuclear Counts falling within Indicated Percentages.*

—	20%	25%	30%	35%	40%	45%	50%	55%	60%	65%	70%	Total counts.
12 controls	—	—	—	—	—	1	12	28	23	7	2	73
50 patients	2	—	5	16	36	41	47	55	28	16	5	251
Class A—25 patients	1	—	3	6	20	31	22	24	12	4	5	128
Class B—25 patients	1	—	2	10	16	10	25	31	16	12	—	123

In Table II. the figures in the horizontal lines indicate the number of counts in which the percentage of polynuclears fell within the percentage limits indicated by the vertical divisions. Chart I. shows the same results in a graphic form, given in percentages—e.g., 38 per cent. of the control counts fell between 55 per cent. and 60 per cent. The 50 patients may be divided clinically into two classes: (*a*) symptoms were noted prior to enlistment (such as shortness of breath and inability to play games); (*b*) symptoms developed during training or after service abroad. The third and fourth lines in Table II. and corresponding diagrams in Chart I. give the figures resulting from this classification.

The polynuclear percentages alone are given in Tables II., III., and V., partly because there is a smaller error in dealing with larger percentages, partly because there is no difficulty in the classification of the polynuclear cells. Only one case showed a moderate eosinophilia (8–14 per cent.), the basophils were always below 2 per cent., usually below 1 per cent. In the two low counts appearing in the division 20 per cent. to 25 per cent., one had an eosinophil count of 9·6 per cent. and the other of 2·5 per cent. The percentage of non-granular cells in the first was 69 and in the second 78. Therefore the polynuclear percentage may be considered a fair inverse index of the number of non-granular cells present.

CHART I.—*Polynuclear Percentages.*



(1) Controls. Mean, 59·43%. S.D., 5·02. *V*, 8·4.
(2) Irritable heart patients, total cases. Mean, 52·175%. S.D., 9·315. *V*, 17·8.
(3) Class A. Symptoms before enlistment. Mean, 51·4%. S.D., 9·2. *V*, 17·9.
(4) Class B. Symptoms after enlistment. Mean, 52·97%. S.D., 9·35. *V*, 17·6.

It will be noted that in the controls 70 per cent. of the whole series fell between 55 per cent. and 65 per cent., and the largest number (39 per cent.) in any single division, between 55 per cent. and 60 per cent. (Only one polynuclear count in the controls fell below 50 per cent., and this occurred in a patient who had no symptoms of "irritable heart," but who had recently suffered from an attack of malaria.) In the patients, however, 41 per cent. of the counts fell between 50 per cent. and 60 per cent., and only 22 per cent. between 55 per cent. and 60 per cent. In Class A the largest number of counts (24 per cent.) fell between 45 per cent. and 50 per cent., while in Class B the largest number (25 per cent.) fell between 55 per cent. and 60 per cent.—i.e., the same division which holds the largest number of control counts.

Diurnal variation in normals and patients.—Two constant factors emerge from a study of the differential counts at different times of the day.

TABLE III.—*Diurnal Variation of the Leucocytes: Polynuclear Percentages.*

Patients.			Controls.		
	6–8 A.M.	10–12 A.M.		6–8 A.M.	10–12 A.M.
No. 1	42%	... 64%	No. 1	56%	... 67%
	40 ,,	... 59 ,,			
	55 ,,	... —	No. 2	55 ,,	... 62 ,,
No. 2	42 ,,	... 50 ,,		51 ,,	... 63 ,,
	50 ,,	... 46 ,,		52 ,,	... —
	61 ,,	... —		52 ,,	... —
No. 3	47 ,,	... 62 ,,		51 ,,	... 65 ,,
	50 ,,	... —	No. 3	53 ,,	... 66 ,,
	58 ,,	... —		53 ,,	... 64 ,,
No. 4	34 ,,	... 53 ,,		53 ,,	... 64 ,,
	20 ,,	... 36 ,,		—	... 65 ,,
	41 ,,	... —		—	... 63 ,,
No. 5	44%	... 54%	No. 4	57 ,,	... 61 ,,
	36 ,,	... 63 ,,			
	39 ,,	... 51 ,,			
	38 ,,	... 58 ,,			
	43 ,,	... 68 ,,			
	—	... 56 ,,			
No. 6	47 ,,	... 55 ,,			
	44 ,,	... 56 ,,			
	46 ,,	... 55 ,,			
	51 ,,	... 59 ,,			
	49 ,,	... 54 ,,			
	—	... 63 ,,			
No. 7	40 ,,	... 69 ,,			
	42 ,,	... 41 ,,			
	51 ,,	... —			
	25 counts. Average 44·4%	21 counts. Average 55·2%		10 counts. Average 53·3%	10 counts. Average 64%

Both in controls and patients the polynuclear percentage is lowest between 6 and 8 A.M., and highest between 10 and 12 A.M. The average variation in both cases is about 10 per cent., but in the patients the polynuclear count is on a lower level at both times of the day, and the individual variations are much greater than in the controls. It will be noted that counts made on the same control at the same time on different days show very little variation. The controls consisted of two medical men and two women. The counts on the controls were made by four different observers, so that personal bias can be eliminated. No observations on the total count were made between 6 and 8 A.M., so that the absolute numbers at that time and at the middle of the morning cannot be compared. (Table III.)

H. G. Ward,[1] in a study of the hourly variations in the cells, found that the polynuclears were highest between 6 and 8 A.M., and lowest about midnight. On the other hand, A. G. Phear[2] states that the percentage of polynuclears is lowest in the early morning before breakfast. In ten observations on the same individual before breakfast he found an average percentage of 50 polynuclears (smallest percentage 47, largest percentage 54). The observations here recorded are in agreement with those of the last-named author.

Effect of rest in bed.—The moderate leucocytosis which these patients with "irritable heart" present when they are up and walking about, is not apparent when they are kept in bed.

Three patients who showed characteristic symptoms were put to bed for three days and then allowed to get up. The total count was estimated at 11 each morning, and differential counts were made every four hours.

Case 1 and Case 2 were kept on ordinary diet throughout. The differential count was of the same type whether in bed

or up—i.e., a low polynuclear count before breakfast, and a moderately high count at 11 in the morning.

The third case was kept on a milk diet while in bed and on ordinary diet when up. The differential count showed a steady rise in lymphocytes on the bed and milk régime,

TABLE IV.—*Total Leucocytes.*

—	In bed.			Up.	
	1st day.	2nd day.	3rd day.	1st day.	2nd day.
Case 1 ...	12,600	10,000	8,700	17,900	17,200
Case 2 ...	11,800	9,100	10,600	16,200	15,400
Case 3 ...	—	—	8,700	—	18,000

but the usual big variations between the granular and non-granular cells occurred when the patient resumed his ordinary life.

Effect of massage.—Three patients were given general massage, one for 20 minutes, the other two for 1 hour each. Very little difference was observed either in the total or differential counts taken before and after the massage.

TABLE V.

—	Length of Massage.	Total counts.		Polynuclear % counts	
		Before.	After.	Before.	After.
Case 1 ...	20 min.	6,800	7,200	60%	62%
Case 2 ...	1 hour.	10,000	10,600	51%	52%
Case 3 ...	1 hour.	13,000	13,700	56%	56%

Effect of exercise.—As the majority of patients showed symptoms of distress on exertion a test exercise was devised to see if these symptoms could be correlated to any change in the blood.

The test was carried out as follows. The patient was told to lie on his bed for one hour before coming to the laboratory, the ward and laboratory being on the same floor. Blood was taken for a differential count and a total leucocyte count. Then the patient was told to go down to the ground floor and back again 10 times at a sharp walk. This involved for each round the descent of two flights of stairs of 30 steps each, walking along the length of a corridor, the ascent of two corresponding flights of stairs, and along another corridor to the laboratory. The patients were watched and stopped if distress became evident. Some of the men were unable to carry out the complete test. A unit of exercise represents the ascent of one flight of 30 steps—i.e., a complete round was counted as 2 units of exercise. The amount of exercise in each case is given in the table, and the time taken over the exercise is noted. Blood was taken again for differential and total counts as soon as the exercise was finished, usually within two minutes of completing the test. The patient then had to lie on his bed for about an hour, and at the end of this period blood was taken again.

Muscular exercise is known to increase the number of leucocytes circulating in the peripheral blood, so it is important to note the degree of leucocytosis occurring in normal individuals as the result of the moderate exercise involved in the staircase test. The test was carried out on 7 controls in the same way as on the patients, except that Nos. 1 to 5 were sitting instead of lying down during the rest periods. Nos. 1 and 2 were medical men, Nos. 3, 4, and 5 were women, Nos. 6 and 7 patients admitted to the hospital for "irritable heart," but who did not show the typical symptoms on examination. No. 7 had recently suffered from an attack of malaria.

Table VI. gives the results of 14 observations in 13 patients, and Table VII. the results of 7 observations in 7 controls. The first test exercise was carried out by Captain Lyn Dimond, R.A.M.C., and the results of his observations are given under No. 5 in Table VI. Line A refers to the count taken after rest and immediately before exercise, Line B to the count immediately after exercise, and Line C to the count taken after the second period of rest. Chart II. gives the results of the total leucocyte counts in a graphic form.

TABLE VI.—*Patients.*

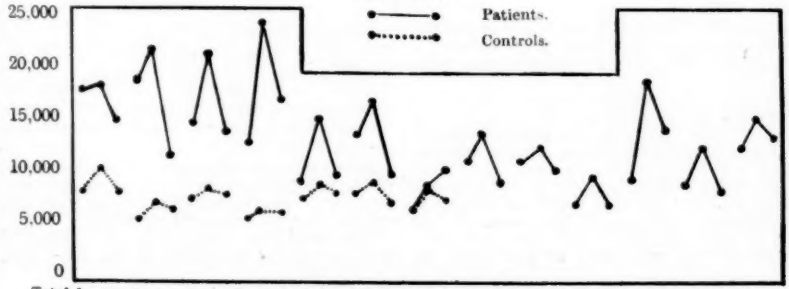
—	Date of test and week of treatment.	Units of exercise.	Time taken over exercise.	Total cells per c.mm.	Differential.				
					Polynuclears.	Lymphocytes.	Eosinophils.	Large mononuclears.	Basophils
1.—Ch.	22/8/16 4th.	12	10 min.	A. 17,600 B. 18,000 C. 14,600	A. 45·5 B. 41·5 C. 56·0	45·75 48·5 36·5	6·0 5·25 4·25	1·25 2·25 1·5	1·5 2·5 1·75
2.—Br.	31/8/16 4th.	8	10 min.	A. 17,600 B. 20,200 C. 10,300	A. 55·5 B. 60·75 C. 53·25	39·75 32·75 41·5	2·75 2·75 2·5	1·75 3·0 1·75	0·25 0·75 1·0
3.—He.	25/8/16 2nd.	20	20 min.	A. 14,500 B. 20,600 C. 13,600	A. 60·75 B. 49·25 C. 73·0	34·25 44·0 24·0	1·25 1·0 2·0	3·5 4·5 1·0	0·25 1·25 —
4.—G.	1/9/16 5th	14	10 min.	A. 12,900 B. 23,800 C. 16,800	A. 47·0 B. 46·75 C. 66·5	47·75 51·0 29·25	2·5 1·25 2·75	2·25 0·75 1·25	0·5 0·25 0·25
5.—T.	7/8/16 11th	10	15 min.	A. 9,100 B. 15,000 C. 9,500	A. 56·5 B. 55·75 C. 60·75	37·0 36·0 33·25	3·5 4·5 3·75	2·75 3·25 2·25	0·25 0·5 2·25
6.—Be.	30/8/16 3rd	10	8 min.	A. 13,400 B. 16,700 C. 9,600	A. 46·25 B. 51·75 C. 66·75	45·5 44·5 28·25	5·5 3·25 2·25	1·75 0·25 2·75	1·0 0·25 —
7.—Q.	5/9/16 7th	8	5 min.	A. 6,900 B. 8,700 C. 10,100	A. 50·25 B. 51·75 C.**	44·5 44·75 —	2·25 2·0 —	1·5 — —	1·5 1·5 —
8.—Wa.	8/9/16 6th	20	14 min.	A. 11,100 B. 13,700 C. 9,000	A. 68·75 B. 62·5 C. 67·25	28·25 32·25 30·5	1·25 3·0 1·75	1·25 0·75 0·5	0·5 1·5 —
9.—Cu.	3/10/16 1st	12	23 min.	A. 10,900 B. 12,100 C. 10,200	A. 69·0 B. 58·5 C. 65·75	28·0 39·25 31·75	1·5 2·0 0·5	1·25 0·25 1·75	0·25 — 0·25
10.—Cl.	5/10/16 3rd	20	15 min.	A. 9,000 B. 11,600 C. 9,900	A. 60·5 B. 54·25 C. 59·5	31·5 37·0 31·75	6·0 6·0 5·0	1·25 2·0 2·75	0·75 0·75 1·0
11.—Ha.	10/10/16 2nd	8	8 min.	A. 7,000 B. 9,500 C. 7,000	A. 58·5 B. 43·0 C. 62·5	36·25 52·25 34·5	2·5 2·5 1·5	1·25 1·5 0·75	1·5 0·75 0·75
12.—Wi.	7/9/16 4th	8	5 min.	A. 10,000 B. 18,200 C. 14,000	A. 65·0 B. 55·0 C. 65·75	28·5 41·0 31·25	5·25 3·5 2·0	0·75 0·25 0·75	0·5 0·25 0·25
13.—Wi.	13/10/16 10th	16	11 min.	A. 9,000 B. 12,400 C. 8,500	A. 61·75 B. 56·25 C. 62·25	33·25 38·75 33·0	3·0 3·25 2·0	1·75 1·25 2·25	0·25 0·5 0·5
14.—A.	8/12/16	10	12 min.	A. 12,500 B. 15,100 C. 13,300	A. 44·75 B. 39·0 C. 46·25	52·5 57·5 49·25	1·25 0·75 1·75	1·25 2·5 2·75	0·25 0·25 —

TABLE VII.—*Controls.*

1.—L.	17/10/16	20	11 min.	A. 8,400 B. 10,000 C. 8,300	A. 59·5 B. 57·75 C. 59·25	34·0 36·5 35·0	2·75 3·25 3·5	3·75 2·0 1·75	— 0·5 0·5
2.—R.	18/10/16	20	7 min.	A. 5,700 B. 7,000 C. 6,700	A. 62·0 B. 54·0 C. 58·5	29·25 36·0 33·75	4·75 4·75 5·0	2·5 3·75 1·5	1·5 1·5 1·25
3.—E.B.	29/9/16	20	18 min.	A. 7,500 B. 8,400 C. 8,100	A. 50·5 B. 50·25 C. 51·0	44·75 46·75 46·0	2·0 1·5 1·25	2·5 1·5 1·75	0·25 — —
4.—G.B.	9/8/16	10	10 min.	A. 5,700 B. 6,200 C. 6,200	A. 61·5 B. 58·25 C. 61·75	32·75 36·25 33·25	2·75 2·0 1·5	2·75 3·25 3·0	0·25 0·25 0·5
5.—M.	12/10/16	20	15 min.	A. 7,700 B. 8,900 C. 8,000	A. 63·75 B. 65·0 C. 63·0	31·0 30·5 32·0	1·5 2·5 2·25	3·0 1·0 2·0	0·75 1·0 0·75
6.—B.	27/9/16	20	18 min.	A. 8,100 B. 8,800 C. 7,300	A. 60·25 B. 61·5 C. 69·25	34·75 34·5 27·25	2·0 1·0 1·0	2·5 2·25 2·0	0·5 0·75 0·5
7.—St. J.	14/11/16	20	20 min.	A. 6,600 B. 8,700 C. 7,600	A. 53·75 B. 49·75 C. 55·75	39·25 45·75 40·5	3·5 1·75 0·25	2·75 2·25 3·0	0·75 0·5 0·5

** Not counted.

CHART II.



Total leucocyte counts. In each chain of three, the dots indicate: (1) Before exercise; (2) after exercise; (3) after rest 1 to 1½ hours.

It will be noted that the first two patients do not show a big rise in leucocytes after exercise, though the levels of the counts are high, but they do show a fairly large fall after rest. These two men did not have the preliminary hours' rest, but were walking about the wards. Therefore the

numbers given in Line C probably represent their leucocyte counts at rest more accurately than the numbers in Line A. It was after these two estimations had been made that the preliminary hour's rest was adopted in the test.

The average total count before exercise is 11,535, the average after exercise is 15,400. The average rise is therefore 33·6 per cent. If the first two men are omitted for the reason given above, the average rise is 40·4 per cent. The maximum individual rise is 84 per cent.

The average count in the controls before exercise was 7100 per c.mm., after exercise 8200, an average rise of 15·4 per cent.

Estimations of the leucocyte rise in normals after muscular exercise by other observers all refer to much more strenuous exercise than the staircase test. For instance, P. B. Hawk[3] estimated the total leucocyte counts before and after athletic competitions and training races. The exercise varied from a 100-yards sprint to a two-mile run. He found an average increase of 57 per cent., the maximum individual increase being 104·4 per cent. after three minutes' water polo. Hawk quotes the work of Willebrand,[4] who employed 12 athletic young men for his test. He gave them gymnastic exercises for 10 minutes, and did blood counts before exercise, immediately after, and again 1 to 1½ hours after. He found an increase in the leucocytes varying from 19·2 to 96·9 per cent., the average being 47 per cent. Neither of these observers appears to have done differential counts. Larrabee[5] also estimated the rise in leucocytes in four cases after a road race of 25 miles. The leucocytosis varied from 14,400 to 22,200 per c.mm.

Effect of exercise on the differential count.—The most constant change observed in the differential count was a rise in the lymphocytes immediately after exercise, and a fall of the same after a rest.

Ten cases showed a rise in the percentage of lymphocytes after exercise, one case showed a fall of lymphocytes of 7 per cent., three cases showed no change (1 per cent. or less). Of these three cases, two showed a fall of lymphocytes after rest; the remaining case was not counted for the third time. Only one case, therefore, differed from the general type—i.e., a rise of lymphocytes after exercise, a fall after rest. Some of the differences were small enough to come within the margin of error. Assuming that a rise or fall of more than 8 per cent. is outside the limits of error and therefore represents a real change in the composition of the blood, we find that five cases show changes within 8 per cent., eight cases show changes of the usual type of over 8 per cent. (maximum change 23·75 per cent.), one case shows a change of the opposite type (i.e., 7 per cent. fall of lymphocytes after exercise and a rise of 8·75 per cent. after rest). In four of the cases the percentage lymphocyte count rose above the polynuclear percentage after the exercise, the lymphocyte counts being 51, 52·25, 48·5, and 57·5 per cent.

Absolute Numbers of Leucocytes Before and After Exercise.

TABLE VIII.—*Patients.*

—	A, before exercise.				B, after exercise.				C, after rest 1-1½ hours.			
	Polynuclears.	Lymphocytes.	Eosinophils.	Large mononuclears.	Polynuclears.	Lymphocytes.	Eosinophils.	Large mononuclears.	Polynuclears.	Lymphocytes.	Eosinophils.	Large mononuclears.
1.—Ch.	8008	6052	1056	220	7470	8730	945	405	8176	5329	620	219
2.—Br.	9768	6996	484	308	12271	6615	555	606	5484	4274	257	180
3.—He.	8808	4966	181	507	10145	9064	206	927	9928	3264	272	136
4.—Ga.	6063	6159	322	293	11126	12138	297	178	11172	4914	462	210
5.—To.	5147	3367	318	259	8362	5400	675	487	5771	3144	356	214
6.—Be.	6197	6097	737	234	8642	7431	542	41	6408	2712	216	264
7.—Q.	3467	3070	155	103	4502	3893	174	130	—	—	—	—
8.—Wa.	7631	3135	138	139	8552	4418	411	102	6052	2745	157	45
9.—Cu.	7521	3052	163	136	7078	4749	242	30	6706	3238	51	178
10.—Cl.	5445	2835	540	112	6293	4292	696	232	5890	3143	495	272
11.—Ha.	4095	2537	175	87	4085	4983	237	142	4375	2415	105	52
12.—Wi.	6500	2850	525	75	10010	7462	637	45	9205	4375	280	105
13.—Wi.	5557	2992	270	157	6975	4805	403	155	5291	2805	170	191
14.—Al.	5694	6563	156	156	5889	8682	113	377	6151	6550	233	366
Average...	6414	4476	372	198	7957	6617	438	275	6969	3762	282	387

TABLE IX.—*Controls.*

1.—L.	4998	2856	231	315	5775	3650	325	200	4917	2905	290	145
2.—R.	3534	1667	270	142	3780	2520	332	262	3919	2261	335	100
3.—E. B.	3767	3356	150	187	4221	3927	126	126	4131	3726	101	141
4.—G. B.	3506	1868	156	156	3611	2247	124	201	3828	2061	93	186
5.—M.	4903	2387	115	231	5785	2714	222	89	5040	2560	180	160
6.—B.	4860	2835	162	222	5436	3050	88	200	5100	2000	74	146
7.—St. J.	3538	2591	231	148	4328	2980	152	195	4237	3078	19	22
Average ...	4162	2508	187	200	4705	3155	195	182	4453	2655	156	158

In the controls five showed a rise of lymphocytes after the exercise, two showed no change. In none of the controls was the variation greater than 7 per cent. Assuming, as before, that a rise or fall of less than 8 per cent. comes within the margin of error, it is difficult to say that there is any definite change in the proportions of the different cells after exercise.

Observations carried out by Captain Lyn Dimond showed approximately the same results. He made 11 observations on six patients before and after a staircase exercise. The total counts were not estimated. The differential counts showed that in nine observations there was a rise in the percentage of lymphocytes after exercise, in one observation there was no change, in the remaining case there was a fall of 11·5 per cent. in the lymphocytes. Of the nine observations showing a rise in lymphocytes, five gave a rise of 8 per cent. or over (maximum 14·5 per cent.), four gave a rise of less than 8 per cent. (2·5 to 5·5 per cent.).

As it has been demonstrated that all the cases show a rise in total leucocytes after exercise, and at the same time a majority show a percentage rise in lymphocytes, it follows that the increase in the number of white cells is largely composed of lymphocytes. Tables VIII. and IX. give the absolute numbers of the different cells in patients and controls in the exercise test. Basophils are omitted as the numbers are too small to be of any value. Taking the average of all the cases, the rise in polynuclears after exercise is 24 per cent., but the rise in lymphocytes is 48 per cent. Eosinophils and large mononuclears are both slightly increased in number after exercise, so that the leucocytosis is a mixed one, but the lymphocytes form the chief part of the increase. In the controls the rise in polynuclears after exercise is 13 per cent., the rise in lymphocytes 25 per cent.

In the next section the changes in the lymphocyte percentages will be noted more particularly, as the variations chiefly occur in them.

Clinical Symptoms of the Patients Tested by the Staircase Exercise.

No. 1, Ch.—Aged 26. History of chorea at 9 years of age. This patient had seen service in France. The onset of his symptoms had been gradual, dating back four years. He showed the usual symptoms of "irritable heart." He made no progress under treatment, and was discharged as permanently unfit. This patient did not have a rest before the exercise began, and therefore showed a high initial leucocyte count—viz., 17,600 per c.mm. The high level of all the leucocyte counts and the change in the percentage of lymphocytes (12 per cent.) would mark this case as a severe one, judging solely from the condition of the blood.

No. 2, Br.—Aged 22. No history of previous infection, service in France. Onset of symptoms had been gradual after service in the trenches. At the time of examination the patient showed the full symptoms of D.A.H. He made no progress, and was discharged as permanently unfit. This man also did not have the preliminary rest, and his initial count was 17,600 per c.mm., with a rise to 20,200 per c.mm. after exercise, and a rest count of 10,360 per c.mm. He showed a slight fall in lymphocytes, 7 per cent. after exercise instead of the usual rise, but the change is sufficiently small to come within the margin of error. Judging from the total leucocyte count the case is a severe one.

No. 3, He.—Aged 19. History of rheumatic fever in 1911. No service abroad. Onset of symptoms gradual since childhood, worse since rheumatic fever. The full symptoms of D.A.H. were present. He made no progress, and was discharged as permanently unfit. The two leucocyte counts taken after rest were practically identical—viz., 14,500 and 13,600. The count after exercise was 20,600. The lymphocytes showed a typical rise of 10 per cent. after exercise and a fall of 20 per cent. after rest. These two points, the 42 per cent. rise of total leucocytes and the 20 per cent. change in lymphocytes, mark the case as a severe one.

No. 4, G.—Aged 24. History of frequent sore-throats. No service abroad. Onset of symptoms gradual, dating back several years. He showed the full symptoms of D.A.H., made no progress, and was discharged as permanently unfit. From the hæmatological point of view this case was the most severe of the series. The total leucocyte count showed a rise of 84 per cent. after 14 units of exercise up to 23,800 per c.mm., and the lymphocytes showed a small rise after exercise, but a fall of 21·75 per cent. after rest.

No. 5, T.—Aged 18½. History of scarlet fever and diphtheria in childhood. Service in France. Onset of symptoms gradual during many years. Full symptoms of D.A.H. were present and the heart was enlarged. He made no progress and was discharged as permanently unfit. This patient showed a rise of 65 per cent. in the total count up to 15,000 per c.mm. His differential count showed little variation, the lymphocytes showing a fall of 2·75 after rest and the polynuclears a rise of 5 per cent. Although the differential count does not give any definite indication, the big rise in the total leucocytes marks the case as severe.

No. 6, Be.—Aged 21. History of scarlet fever and rheumatism in 1907. No service abroad. Onset gradual since illness in 1907. The full symptoms of D.A.H. were present. The patient made no progress and was discharged as permanently unfit. This patient had a total count of 16,700 per c.mm. after exercise and a count of 9600 after the second rest. The percentage of lymphocytes showed no change after the exercise, but a fall of 16·25 per cent. after a rest. Therefore the case was regarded as a severe one.

No. 7, Q.—Aged 24. History of tonsillitis in 1914. No service abroad. Had had symptoms for many years. He did not show any improvement and was discharged as fit for sedentary work. Although this patient did not show any improvement, his case was considered to be, clinically, one of the least severe of the series, and there was a suspicion that he was making the most of his symptoms. This case from the

hæmatological point of view did not show any characteristic points, except that the lymphocyte count was somewhat high, 44·5 per cent. All the total counts fell within normal limits, only a rise from 6900 to 8700 per c.mm. after exercise being noted. The differential counts before and after exercise were practically identical. This patient only did a short exercise, four times the two flights of stairs, as he said he could not go on, though he showed no objective signs of distress. It was noted at the time that he made no attempt to exert himself.

Two views may be taken of this patient. First, that he was a genuine slight case of D.A.H., but did not exert himself sufficiently to show the characteristic changes, against which view is the normal total count after slight exercise, and in favour of it the relatively high lymphocyte counts. Second, that this case was not a genuine one of D.A.H., and that the blood counts confirmed the clinical suspicion of malingering.

No. 8, Wa.—Aged 19. History of chronic suppuration and otitis media. Service in France. Onset of symptoms sudden, following bombardment. His symptoms of D.A.H. were mild, he made slight progress, and was discharged in category "a" (fit for general service). This case showed a small rise in total leucocytes after exercise, from 11,100 to 13,700 per c.mm. There was little change in the differential count the lymphocytes rose 4 per cent. after exercise and fell 2 per cent. after. There was no lymphocytosis, the highest reading being 32·25 per cent. Here the blood picture appears to confirm the clinical diagnosis of a mild case.

No. 9, Cu.—Aged 21. No history of previous infection. Service in France and the Dardanelles. Symptoms came on after four months' service in France and after "malaria" and dysentery. He showed the usual symptoms, but improved under treatment. This patient did not show very marked changes in the blood. The leucocyte count at rest was 10,900 and after exercise 12,100. The lymphocytes rose 11 per cent. after exercise and fell 7·5 per cent. after rest. The highest lymphocyte reading was 39·25 per cent. From the blood findings the case should be classed as a mild one.

No. 10, Cl.—Aged 24. History of "brain fever" as a baby. Service in France. Onset of symptoms gradual after one year in France. He showed the usual symptoms, which improved slightly, but he was only able to proceed to the higher exercises with difficulty. This patient only showed a moderate rise in leucocytes after exercise—viz., 9000 to 11,620. His lymphocytes rose 5·5 per cent. after exercise and fell 5·25 per cent. after rest. He was therefore classed at a mild case. The first test was carried out in the third week after admission. In the seventh week the test was repeated, except that the third estimation was not carried out. Very little change was observed. The leucocytes rose from 9,700 to 11,700 per c.mm., and the lymphocytes rose 3·25 per cent. The highest lymphocyte reading was 37 per cent. on the first date, and 33.25 per cent. on the second. From the blood findings the patient had made no improvement, though the variations are not very marked.

No. 11, H.—Aged 19. History of whooping cough, chicken-pox, tonsillitis. No service in France. Symptoms for several years. He showed the full symptoms of D.A.H., made no progress, and was discharged as permanently unfit. This case is interesting, as the leucocyte count at rest was normal, 7,000, rose to 9,500 per c.mm. after exercise (he only did eight units of exercise), but his lymphocytes showed a big rise from 36·25 to 52·25 per cent., and fell again after exercise to 34·5. The absolute numbers show that the increase in leucocytes was almost entirely due to lymphocytes, the polynuclear numbers remaining practically stationary, so that the readings after exercise were 4045 polynuclears and 4963 lymphocytes. From this case it would appear to be necessary to do a differential count as well as a total count in the test exercise, otherwise the lymphocytosis and big variation in percentages would not be noticed.

Nos. 12 and 13 Wi.—The two estimations refer to the same patient. The first was made in the fourth week after admission, the second in the tenth week. Aged 24. No history of previous infections. Service in France. Onset of symptoms gradual after one year in France. His symptoms were moderate. He made considerable progress while in hospital, and was discharged in category "a." On the first occasion patient could only do 8 units of exercise. The rest count was 10,000, after exercise 18,200. The lymphocytes rose 12·5 per cent. and fell 9·25 per cent. after rest. These findings would mark the case as severe. Six weeks later the test was repeated; this time the patient did 16 units of exercise. The total count rose from 9000 to 12,100 and the lymphocytes rose 5·5 per cent. On these findings alone the case would be classed as mild. Two weeks later, just before the patient's discharge, when he was sufficiently fit to do route marches, an estimation was done without any preliminary rest or exercise. The total count was 7300 per c.mm. and the polynuclear percentage 59. This case seems to indicate that the condition of the blood varies with the general progress, and that one test exercise is not of much value in the prognosis, although it may be useful for diagnosis.

No. 14, A.—Aged 22. Symptoms for several years. No history of previous infection. Service in Mesopotamia. Present symptoms of moderate severity; no progress. This patient had a high lymphocyte count throughout. He was found to be a carrier of *Entamœba histolytica*. He showed the characteristic change in the blood after exercise.

A list of these patients drawn up by the clinicians in accordance with the severity of the symptoms was compared with a similar list based on the blood findings. The correspondence between the two methods of classification was very close.

The four most severe cases by clinical standards showed the highest total leucocyte counts after exercise (18,000 to 23,800), the four least severe cases showed only a moderate leucocytosis after exercise (8700 to 13,700). The remaining cases were intermediate to the above groups both in the severity of their symptoms and in the degree of leucocytosis (9500 to 18,000). A big rise in the lymphocyte percentage after exercise was regarded as a sign of some severity, even if the total count was below 10,000 per c.mm.

An analysis of these cases demonstrates that the men who have a history of symptoms dating back many years show a higher lymphocyte count than the men who date their symptoms as subsequent to service abroad.

The cases may be divided into two classes: In Class A, in which the onset of symptoms dates back to civilian life, the highest lymphocyte counts are respectively, Case 1, 48·5 per cent.; Case 3, 44 per cent.; Case 4, 51 per cent.; Case 5, 37 per cent.; Case 6, 45·5 per cent.; Case 7, 44·75 per cent.; Case 11, 52·25 per cent.; Case 14, 57·5 per cent. The average is 47·5 per cent. In Class B, in which the onset of symptoms is dated from the strain of actual service in the trenches, the highest lymphocyte counts are respectively, Case 2, 41·5 per cent.; Case 8, 32·25 per cent.; Case 9, 39·25 per cent.; Case 10, 37 per cent.; Case 12, 41 per cent. The average is 38·2 per cent. In the controls the average of the highest lymphocyte counts is 38·2 per cent. Of the first class, A, three of the eight men had served abroad, six were discharged as permanently unfit, one case, No. 7, in which there was a suspicion of malingering, was discharged in category "d," and one is still in hospital. In the second class, B, all had served abroad, three of the five men were discharged in category "a," one as permanently unfit; the other one is still in hospital.

This classification seems to indicate that men who have shown signs of "unfitness" in civilian life are very liable to break down while still in training, and are not likely to improve much under treatment, while the men who have passed through their training successfully and then break down under the strain of foreign service are likely to obtain considerable benefit from treatment.

Diagnosis.—Patients with conspicuous symptoms of "irritable heart" show in nearly every case a moderate leucocytosis. Patients with slight symptoms may only show the leucocytosis after moderate exercise. The same amount of exercise in normal individuals will produce a smaller response. Patients with symptoms of long standing are more apt to show a higher lymphocyte count than those with symptoms of recent origin. This, however, is not invariable, as the patient who showed the most marked degree of lymphocytosis had a history of only six weeks' duration. The percentage rise in lymphocytes may be considerable in patients who do not show any appreciable rise in the number of leucocytes after exercise. It is therefore necessary to estimate both the total and differential counts if the effect of exercise is to be used as a point in diagnosis. As a help in diagnosis it is suggested that the following test should be carried out.

The patient should be made to perform an amount of muscular work equivalent to the staircase exercise, and his total and differential counts estimated immediately afterwards. He should then lie down for an hour while the counts are in process of estimation. If the total count is below 11,000, and the lymphocyte count is below 45 per cent., he can be regarded as negative, and a second count is unnecessary. If, however, the total count is below 11,000, but the lymphocyte count above 45 per cent., a second estimation should be made after an hour's rest. If the total count immediately after exercise falls between 11,000 and 14,000 per c.mm., the condition may be regarded as mild, when the count falls above 14,000 as moderately severe. If after exercise the total count is below 11,000, but the lymphocyte count is high (above 45 per cent.), and after rest shows a big percentage fall (10 to 20 per cent.) the case may be regarded as moderately severe.

A few illustrations will show how the test can be shortened in practice. Nos. 1, 2, and 3 were three consecutive patients sent up to the hospital for diagnosis. No. 1 did 20 units of exercise; his total count immediately after was 8600 per c.mm. and his percentage of polynuclears 62. The findings were negative and no further examination was done. No. 2 did 12 units of exercise; his total count immediately after was 16,700 per c.mm.; this alone was sufficient to class him as a moderately severe case. No. 3 did 20 units of exercise; his total count after was 12,000 per c.mm., polynuclear percentage 77. He was regarded as a mild case. In each instance the clinical findings agreed with the findings based on the leucocyte estimations.

It cannot be said definitely that a normal blood count in these patients excludes a diagnosis of "irritable heart." On the other hand, a blood count which shows a marked deviation from the normal is a positive sign entirely outside the control of the patient, and may be regarded as a definite objective point in diagnosis. The blood count does not give much help in prognosis, as the condition of the blood appears to vary with the general condition, and this can be judged by the usual clinical methods.

The degree of lymphocytosis present in many of these cases appears to bear out the statement of Curschmann[6] that a high lymphocyte count is indicative of a "substandard" constitution. This author only gives percentages from the differential count, and does not make any statement as to the total number of leucocytes present in his cases.

Summary.—The following conclusions apply to patients who show the signs and symptoms referred to at present under the term "irritable heart."

1. At absolute rest there is a slight leucocytosis or no leucocytosis.

2. While up and about there is a decided leucocytosis. In many, and especially in cases of long standing, there may be a relative and absolute lymphocytosis.

3. The variability of the different kinds of leucocytes is greater (more than double) than in normal individuals.

4. The response to muscular exercise is similar to that found in healthy subjects, but is exaggerated in its degree. This exaggerated response can be used as an objective sign in diagnosis.

5. The degree of leucocytosis and of variability in percentages after exercise is proportionate to the severity of the symptoms.

Addendum.

The error of differential counts.—The question of making a reasonably accurate differential count presented some difficulty. Owing to the fact that many of the preparations had to be made at different times of the day and by different individuals, it was necessary to depend upon a dried film as a routine. Also the object in view was to devise a method which could be carried out as a clinical test. Thus in the test exercise described above three estimations of total leucocytes and three differential counts had to be carried out, so that the smallest number of cells compatible with reasonable accuracy were counted. Four hundred cells were counted as a routine, and an attempt was made to estimate the margin of error by the method used. The films were spread by one slide upon another. This method undoubtedly exercises a selective action, some of the larger leucocytes being carried along to the edge of the film. A large error is possible by simply counting down the middle of the films. The routine adopted was to count 400 cells—100 down the middle, another 100 right across the slide, another along one of the sides, and another at the end of the film. This method of distributing the count appeared to be satisfactory, as the same slides counted by two observers gave approximately the same results.

Comparison of wet and dry counts.—The error was estimated by counting a dry film against a wet preparation. Dry and wet films were prepared simultaneously, and 400 cells were counted in each by two observers independently, and the results compared, the count in the dry film being distributed as described above. The wet film was prepared in the following manner, the procedure being a combination of the wet counting methods recommended by A. G. Phear[7] and Hill.[8] The stain was prepared according to Hill's method, except that Jenner's stain was found to be as good as, if not better than, Wright's for the purpose. One soloid stain (Wright or Jenner) was dissolved in 10 c.c. of pure methyl alcohol. The actual diluent was made up fresh each day from this stock solution in the following proportions: Distilled water, 12 parts; acetone, 3 parts, methyl alcohol, 1 part; stain (filtered), 4 parts. The mixture must be thoroughly shaken.

A small drop of blood is picked up on a slide, a small quantity of the diluent dropped on it, and the blood is mixed with the stain by blowing a current of air on to the surface of the drop through a pipette. This mixing must be done quickly, otherwise the acetone will evaporate and the eosin-methylene blue combination will be precipitated. The least trace of acidity will cause precipitation. The drop is covered quickly by a cover-slip, the under surface of which has been previously rimmed with liquid parolein for one-eighth of an inch. The leucocytes can be easily recognised and counted with a 1/8 in. objective. The details are seen best with a 1/12 in. objective, the light being considerably reduced. The eosinophils stand out brilliantly, the granules stain a deep crimson and are so prominent that the nucleus is almost obscured. In the polynuclears the protoplasm takes up a pinkish colour and the granules are very noticeable. The shape of the nucleus is not so clearly defined as in a dry film. The large mononuclears are distinctive, appearing as large oval cells with a relatively small kidney-shaped nucleus, the protoplasm having a distinct bluish tinge. In the lymphocytes the protoplasm is practically colourless.

Six consecutive parallel counts carried out by two observers independently gave the following results, 400 cells being counted in each. Nos. 1 and 2 from a control. Nos. 3 to 6 from 2 patients. (Table X.)

TABLE X.—*Comparison of Wet and Dry Films.*

No.	*Wet Counts.* (Counted by Observer A.) Differential count, 400 cells.					*Dry Counts.* (Counted by Observer B.) Differential count, 400 cells.				
	Polynuclears.	Lymphocytes.	Eosinophils.	Large mononuclears.	Basophils.	Polynuclears.	Lymphocytes.	Eosinophils.	Large mononuclears.	Basophils.
1	64·5	32·25	1·0	2·25	0	65·0	30·5	2·5	1·0	1·0
2	64·0	32·75	2·0	1·25	0	63·0	32·0	2·25	2·0	0·75
3	58·0	34·0	5·0	2·5	0·5	61·75	33·25	3·0	1·75	0·25
4	55·0	37·0	4·5	3·0	0·5	56·25	38·75	3·25	1·25	0·5
5	62·0	31·0	3·25	3·0	0·75	62·25	33·0	2·0	2·25	0·5
6	45·0	45·5	5·25	3·5	0·75	48·0	44·0	4·0	3·0	1·5

Taking the wet counts as a standard, the dry counts show an average error of 1·5 per cent., with a maximum error of 3·75 per cent. That the cells are evenly distributed in the wet films can be proved by comparing the numbers of polynuclears in the different hundreds. Thus, in one wet film, 400 cells were first counted at random. The percentage of polynuclears was 64·5. Then an attempt was made to count every cell in the film (over 3200). The percentage was 64·37, and the eight successive lots of 400 each gave percentages of 60·5, 67, 64, 63·25, 60·75, 68·25, 65, and 66·25. The chances of error may be gauged from the following statement taken from statistical tables[9]: given a count of 403 leucocytes, and an observed percentage of 39 lymphocytes, the chances are 9 to 1 that the error will fall within 4 per cent.—i.e., that the truth will lie between 35 per cent. and 43 per cent. Throughout the paper the probable margin of error has been considered to be 4 per cent. in a differential count of 400 cells.

In conclusion, I wish to acknowledge my indebtedness to Captain Lyn Dimond, R.A.M.C., for his help in carrying out the investigation, and also to Miss I. B. Matthews, of Toronto, for the great assistance she has given in making many of the differential counts.

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THE INFLUENCE OF MATERNAL ORAL SEPSIS ON THE FŒTUS AND MARASMIC CHILDREN.

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AT a time like the present, when the children of the British Empire are such an imperial necessity and asset to the nation, it is the aim of every medical man to do all in his power to enable those children to be as healthy and vigorous as possible; therefore it appears opportune to call attention to a condition of maternal oral sepsis and its resulting evils upon the children that has not received any attention from the medical world before the present investigations were undertaken, so far as I am aware. For the past nine years observation has been kept by myself upon marasmic children and their mothers, and also those children who, being breast-fed, yet suffered from vomiting and diarrhœa, and the conditions of the mothers' mouths carefully noted. The clinical evidence strongly points to the septic condition of the mother's mouth having a very marked effect upon both the fœtus and the post-natal condition of the child. The cases examined do not include such obvious causes as syphilis and other well-known conditions, that are universally admitted to cause stunting in growth or wasting in children, &c., but are all cases where clinically nothing of a pathological condition was found in the mother other than in the mouth. In some cases, however, the mother's milk rapidly failed; later in this article this matter will be discussed.

All the cases examined, and of which notes were made, were first examined by physicians as to their condition, and then

referred to the author as being more or less obscure, and about whom nothing definite was known. In an article by Dr. J. W. Ballantyne [1] he says:—

"It has been shown that in the lower animals the placenta has a real affinity for some toxic bodies, and by storing them up in its substance prevents them passing to the fœtus. In this respect it resembles the action of the liver in the adult, being an accumulator of poisons. Of course, it does not necessarily prevent their passage, although it may store them up. Bacteriological researches have shown that through it can pass the bacillus of anthrax, of fowl cholera, typhoid fever, the pneumococcus, the streptococcus, the spirillum of Obermeier, the bacillus of glanders, the pathogenic organism of hydrophobia, and, perhaps, the hæmatozoon of malaria. So we have now to look at the opposite side of the question, viz., the placenta as a means of access of germs and toxins to the fœtus. It would seem also that it is not necessary for the placenta to be macroscopically diseased, as by hæmorrhage into its substance, in order that the organisms may pass; in fact, in some cases in which the germs have passed the placental tissue does not appear to have been even microscopically affected. The fact that it is through the placenta that infection reaches the fœtus has an important bearing upon the primary lesions in the fœtus. The germs and toxins arrive at the body in the blood, passing first through the placenta and umbilical vein, then either through the liver or ductus venosus, then through the heart, and so to the whole circulation. Erysipelas in the mother has been found associated with streptococcic endocarditis in the fœtus and not with erysipelatous inflammation of the fœtal skin (reported by Bidone). Atrophic conditions of the subcutaneous tissue are sometimes found as congenital states."

Now, if these conditions have been demonstrated and certain well-defined micro-organisms found in the fœtus, logically the toxins from the maternal septic mouth should also produce their effect on the fœtus by the same means of transmission. On the other hand, the mother may herself acquire a certain amount of immunity by antibodies from her own toxins, and that would explain the birth of certain healthy and vigorous children in spite of the maternal oral sepsis.

Stress is laid upon the term oral sepsis, as certain of the mothers' mouths showed the teeth to be well formed, free from caries, and with all the teeth *in situ*. In many cases where the mother had several children there was found a progressively increasing change for the worse in the health and vigour of the younger children of a greater degree of intensity than one would expect to find as the result of repeated pregnancies, suggesting other agencies at work than the natural exhaustion of the mother, and explicable on the ground of a successively increasing toxæmia. The following cases will give some data for arriving at certain definite conclusions, but it must be understood that these cases are just ordinary ones occurring in hospital practice, as all the material for this article has been obtained from patients attending the East London Hospital for Children, Shadwell, and the Prince of Wales's General Hospital, Tottenham, and not from private practice.

CASE 1.—Male, aged 8 weeks. Marasmus. Weight 10 lb. 4 oz. Breast-fed. Vomits after each feed. Motions curdy. Very flatulent. Condition of mother's mouth: Very septic; teeth [2] $\frac{8^{***}\ 7^{***}\ 4\ |\ 5^{*}\ 7^{*}\ 8^{***}}{8\ \ 7\ \ 6\ 5\ 3\ |\ 3\ 4\ 5\ \ 7\ \ 8}$ all badly carious and septic. Had six children, two living, including the patient, and four dead. Eldest and youngest alive. Mother fed children on breast for first few weeks; then on bottle, as her milk went.

CASE 2.—Male, aged 2½ months. Marasmus. Weight 6 lb. 2 oz. Breast-fed for first two weeks; Nestlé's milk after. Condition of mother's mouth: Very septic; salivary calculus; pus and chronic gingivitis round all teeth. $\frac{6^{***}\ |\ 6}{6\ \ \ 5\ |\ 6}$ carious. Mother had eight children, three living, five dead. The patient was the first marasmic child, according to the mother's statement. Mother's milk went soon after she got up with all the earlier children; last three children breast-fed. The two born immediately before the patient had died. Mother aged 34; father 33, healthy.

CASE 3.—Male, aged 10 weeks. Marasmus; weight 5 lb. 14 oz. Bottle-fed from birth. Condition of mother's mouth: Oral sepsis; teeth good except $\frac{|\ 2}{6\ |}$ carious. Chronic gingivitis. Salivary calculus and pus round necks of teeth. Had five children. Child immediately before this one, dead: others alive and healthy. Dead child marasmic; breast-fed. Mother aged 27; father 28, healthy.

CASE 4.—Male, aged 5 months. Marasmus. Breast-fed. Condition of mother's mouth: Oral sepsis; chronic interstitial gingivitis and débris of food at necks of teeth; septic roots of $\frac{|}{6^{**}\ 5^{*}\ |}$; teeth good and well formed. Mother was advised to have her mouth treated but refused, so advised that child should be taken off breast and artificially fed. Mother had nine children, four dead, five living. Child older than the patient, aged 2 years, wasted until 14 months old, when it was taken off the breast. Second and third children breast-fed for five months and died of marasmus.

CASE 5.—Female, aged 5 months. Marasmus; weight 8 lb. 5 oz. Breast-fed. First child. Always sick after breast, almost immediately. Condition of mother's mouth: Oral sepsis; salivary calculus and pyorrhœa alveolaris round lower incisors; some chronic gingivitis round upper teeth. Teeth good. No caries; $\frac{|}{6\ 5\ |}$ have been extracted. Mother aged 20; father 22, healthy.

CASE 6.—Male aged 4 months. Marasmus; weight 6 lb. Breast-fed for three months, then milk and barley-water. Had diarrhœa last four weeks. No vomiting. Child died in hospital. Post-mortem report: "All viscera normal as far as could be ascertained." Condition of mother's mouth: Very foul and septic. Would not allow a proper examination to be made. Much pus could be squeezed out round lower incisors by finger.

CASE 7.—Male, aged 12 months. Marasmus: weight 11 lb. 8 oz. Breast-fed. Condition of mother's mouth. Very septic, pyorrhœa alveolaris at incisor region. Teeth: $\frac{7^{***}\ |\ 6^{***}\ 7^{***}}{|}$, all suppurating. Had six children altogether, four living (aged 10, 9, and 5 years, and the patient). The two children born immediately before the patient had died from marasmus. Mother, aged 36.

CASE 8.—Male, aged 6 weeks. Marasmus; weight 8 lb. Breast-fed. Condition of mother's mouth. Terribly septic, all teeth bathed in pus. Teeth in mouth:—

$$\frac{8\ 7\ 6^{***}\ 5\ 4\ 3\ 2\ 1\ |\ 1\ 2\ 3\ 4\ 5^{*}\ 6\ 7}{8\ \ \ \

CASE 16.—Female, aged 1 year and 2 months. Marasmus. Breast-fed. Wasted up to the age of 8 months, then taken off breast and put on bottle. Condition of mother's mouth: Very septic; pyorrhœa alveolaris and salivary calculus. Teeth: $\frac{7^{***}\ 6^{***}\ 5^{*}\ 4^{*}\ 2^{*}\ |\ 2^{*}\ 4^{*}\ 6^{***}\ 7^{***}}{6\ |\ 3^{*}4^{*}\ |\ 8^{**}}$ carious and septic. Three more children alive, all healthy. Eldest bottle-fed, others on breast.

CASE 17.—Female, aged 6 weeks. Marasmus; weight 3¼ lb. Premature child, between seven and eight months. Condition of mother's mouth: Exceptionally foul and septic. Sleeps with upper denture (vulcanite, covering palate) in mouth. Has not removed denture from mouth for 12 months. Said she was told by dentist (?) never to take it out of mouth. On removal, palatine surface of denture covered with decomposed food, &c.; very malodorous. Palate very inflamed and covered with ulcerating patches; four carious teeth in mouth. Six children living and healthy; one (next to patient) dead (marasmus); all breast-fed.

CASE 18.—Male, aged 7 weeks. Marasmus; weight at birth, 10 lb.; present weight, 6 lb. Breast-fed. Condition of mother's mouth: Oral sepsis; pyorrhœa alveolaris round lower incisors. Teeth: $\frac{6^{*}\ 4^{*}\ 1^{*}\ |\ 1^{*}\ 2^{*}\ 3^{*}\ 4^{*}\ 5^{*}}{4^{*}\ |}$ all carious and septic. Had four children and one miscarriage. Miscarriage before birth of patient, 18 months ago. Also boy of seven months died half an hour after birth. All children breast-fed; two eldest children healthy. Mother aged 33; father 37, healthy.

CASE 19.—Female, aged 13 months. Marasmus. Breast-fed until the age of 3 months; bottle-fed since. Condition of mother's mouth: Oral sepsis; chronic gingivitis; pus round necks of teeth. Teeth: $\frac{6\ 4^{*}\ |\ 6^{**}}{7^{**}6^{**}\ |\ 8^{**}}$ carious and septic. Had three children and one miscarriage at six months before the birth of the patient. Mother's milk gradually goes when she gets up, and not then sufficient to feed children. Mother aged 29; father 29, healthy.

CASE 20.—Male, aged 3½ months. Marasmus; weight, 9 lb. 5 oz. Breast-fed. Condition of mother's mouth: Great congestion of gums; salivary calculus round teeth. Teeth: $\frac{\ |4^{*}\ 5^{*}\ 8^{***}}{\ |}$ carious and septic. Milk gradually went six weeks after the birth of this child. Four children besides this one, all alive and healthy.

In the analysis of these cases it will be noticed that the health of the children becomes progressively worse in the younger ones in Cases 1, 2, 3, 4, 7, 8, 9, 13, 17, 18, and 19, pointing to an increasing maternal toxæmia as the condition of the mother's mouth becomes more septic, this sepsis having an adverse effect upon the health of the children. In Case 17 the mucous membrane of the mother's mouth covered by the denture was exceedingly inflamed and covered with small areas of ulceration, the whole forming, in fact, an ideal area for the absorption of toxic material. The mother expressed herself very strongly in terms of indignation when it was suggested to her that the condition of her mouth might be the cause of her child's health and the prematurity of its birth, as she considered it clean, and a stigma had been cast upon her. Certainly the sepsis arising from the retained denture had more to do with the child's condition than anything else. In Cases 1, 2, 3, 4, 7, 8, 15, 17, and 18 one or more children were dead. It is not claimed in every case that the maternal oral sepsis was the cause of the death of all these children; but it does seem to suggest that the children were born with a vitality impaired, caused by a maternal toxæmia, and therefore the children were less resistant to the common diseases of childhood than children whose vitality is unimpaired.

In Cases 18 and 19 miscarriage occurred immediately preceding the birth of the marasmic children, and in Cases 17 and 18 there were premature children. It is well known how often the above two conditions are produced by syphilis, and if a syphilitic toxæmia is capable of producing these conditions; it is surely not unreasonable to expect certain other toxæmias to have a similar effect upon the fœtus. There is not sufficient data collected yet to be dogmatic upon this point, but it would seem as if an oral sepsis in certain cases were the deciding factor.

In Cases 5 and 10 the child vomits after taking the breast, thereby showing there is some strong disturbance in the alimentary tract, and giving evidence of a toxic condition of the mother's milk. Dr. J. Haig Ferguson, in his article on "The Pathology of the Puerperium,"[3] writes as follows.

"Organisms can gain access to the breast through its numerous ducts when there are any abrasions on the nipple or areola, and as such breaches of surface are frequent in lactating women the entrance of pathogenic organisms readily takes place. These organisms are mostly pyogenic, and thus it is not to be wondered at that the least abrasion of the nipple becomes a septic wound. Healthy mother's milk does not come from the breast absolutely sterile. Staphylococcus pyogenes albus and aureus are commonly found and probably find their way into the milk from without, through the milk ducts. On the other hand, organisms may reach the milk through the blood in women suffering from septic diseases."

If organisms can reach the milk through the blood it is much more likely that toxins should reach it by the same channel.

In Cases 1, 2, 19, and 20 the mother's milk disappears. In many cases the disappearance of the mother's milk would point to the selective affinity of certain toxins on the secreting cells of the mammæ, thereby producing in some cases a diminution in the quantity of the milk, and in others a deficiency in the normal constituents (e.g., fats, salts, &c.) of the milk. In some 10,000 cases of infantile diarrhœa and vomiting where the children have been suckled on the breast, these cases extending over a period of nearly 10 years, the child has been immediately taken off the breast and artificially fed, and in the great majority of cases the diarrhœa or vomiting has ceased. These cases have been treated by different resident and also non-resident medical officers on my urgent representations, and in many cases the mother's mouth has been treated, and the child again fed on the breast with gratifying result. The same treatment has been carried out in numerous cases of wasting children with marked good results, proving beyond doubt that the toxic effect of the mother's milk was due to oral sepsis.

Dr. J. Lamond Lackie writes in his article on "The Physiology of Pregnancy"[4]:—

"Pregnancy creates important changes in the different systems and organs of the body. The blood and the nervous system are affected to the greatest extent, but practically all the functions of the body are more or less modified. Since the pregnant woman has to perform nutritive and excretory functions for herself and her fœtus extensive changes in the general system must occur. So long as these changes take place within certain limits, health is preserved and improved, but when carried to excess they lead to serious complications. Much has been written on the subject of the toxæmia of pregnancy. It is now believed by some authorities that many of the hitherto supposed physiological symptoms of pregnancy are the results of slight toxæmia, and that the graver complications of pregnancy, labour, and the puerperium are due to intense toxic infection. Vomiting, pigmentary changes in the skin, neuralgia, irritability of temper, &c., have generally been supposed to be normal, since they are so common, but possibly they are due to the presence of toxins. As pregnancy advances the general economy becomes adapted to the new conditions and the symptoms of poisoning pass off. The emunctory organs work at high pressure, but if one of them gives way, then symptoms of toxæmia become intensified, and may become so serious as to endanger the patient's life. Eclampsia is the most striking example of severe toxic infection. It is no longer regarded as a disease primarily of the kidneys. The causes of these toxic conditions during pregnancy, labour, and the puerperium are varied, and include heredity, climate, previous renal disease, dyspepsia, hepatic disorders, anæmia, and tight lacing. Early recognition of toxic symptoms is important, as active treatment is frequently necessary to prevent serious complications."

Now, looking at these conditions of toxæmia, two of which at least are known to be influenced by oral sepsis—viz., dyspepsia and anæmia—it does seem rational that any toxic state in the mother, other than metabolic, might be the factor that would induce one or other of these toxæmias of pregnancy and act as the proverbial straw that breaks the camel's back, and when no other toxic focus can be ascertained, and a septic condition of the mouth is present, it is logical to assume that that sepsis may make all the difference between a normal and a pathological pregnancy.

The conclusions drawn from a series of some 500 cases, from which the above 20 cases are a fair selection, are:—

1. The toxins from the maternal oral sepsis have a very strong influence in a large number of cases upon the vitality of the rapidly growing fœtus, so that the child is handicapped from before birth with a lowered vitality, and therefore the marasmic condition is ante-natal in its inception.

[3] Green's Encyclopædia of Medicine.

[4] Ibid.

2. That prematurity of birth and miscarriages, where no other cause can be discovered, are brought about by the toxic state of the mother induced by the septic condition of her mouth.

3. The diminution in the quantity, or alteration in the quality, of the mother's milk, where no other cause can be ascertained, is due to the selective affinity of certain toxins for certain secretory cells of the mammæ, and where no such diminution or alteration can be demonstrated, then the toxins, and in some cases micro-organisms themselves, are in the milk.

4. In the toxæmias of pregnancy and the puerperium the high pressure at which the emunctory organs are working is probably adversely influenced by the toxic state produced by the mouth, and this is the deciding factor in many cases that just brings the balance down on the wrong side and results in eclampsia or the other toxæmic conditions.

I would like to take this opportunity of thanking all those who have been good enough to help me in my investigations, especially Dr. R. S. Frew, for referring numerous cases, and also Dr. Gordon Moore and Dr. Eisdell Moore for their interest in the subject, and also for their care in the treatment of cases. Sister Berkeley, for the trouble she displayed in getting the mothers of in-patients to come to see me, is especially thanked. Dr. Harold K. Waller, whilst resident medical officer at the East London Hospital for Children, also referred some cases to me for investigation.

If the interest of the medical world can be aroused to take some notice of the important rôle which oral sepsis plays in pregnant women, this article will not have been written in vain; and a plea is here made for the systematic examination and treatment of the mouths of expectant mothers, as marasmus in children should be treated whilst the child is still in utero, paradoxical as this may sound; also many pregnancies will result in a normal instead of a pathological termination or complication by such treatment.

It is interesting to observe that in two cases where the mother had had marasmic children immediately before the last-born child, after the mother's mouth had been treated the next pregnancy resulted in a healthy child and no marasmus has supervened.

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THE VAGINAL PLUG.[1]

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THE treatment of ante-partum hæmorrhage by means of a vaginal plug is one of the oldest devices of surgery, yet it is within recent years only that the method of applying the plug has been properly understood. I remember hearing, when a student, my lecturer on obstetrics assert that he knew of no more efficient material for plugging than his silk pocket-handkerchief, and to illustrate his contention he took from his pocket an enormous scarf, dull red in colour and stained deeply by snuff and nasal secretion. I remember also an elderly doctor asserting that the family bath sponge made a most efficient vaginal plug. In my early professional days it was considered dangerous to introduce several small plugs lest some of them should be subsequently left in the vagina. It was to guard against this danger that the ridiculous kite-tailed arrangement was devised.

The subject of vaginal plugging was, however, seriously discussed only by the antiquated obstetrician, for the then modern one considered the method to be the most unsuccessful of futile manœuvres. At the present time one can hardly appreciate how great was the moral courage that enabled Sir William Smyly to become its advocate, and how keen and resentful was the opposition that his advocacy of it induced. The controversy has long since been forgotten, and statistics have proved that in its efficiency the plug has at present no rival.

The method as now practised depends for its efficiency on the capacity of the plug to push the lateral fornices of the vagina far up into the abdomen, so that they can be felt by abdominal palpation as hard rounded tumours situate well above the level of Poupart's ligaments. To plug efficiently the left hand should be passed into the vagina with the palmar surface directed towards the hollow of the sacrum, while the tips of the fingers lie behind the cervix. Small pieces of cotton-wool, squeezed out of lysol solution and each the size of the thumb knuckle, are then taken and inserted by means of the right hand round the cervix. The fingers of the left hand are kept busy squeezing the pellets into a compact mass and forcing the spaces between them to permit the insertion of still another plug. This process is continued in a systematic manner from above downwards till the vulva is reached and the vagina can hold no more. A T-bandage is applied to keep the plug in position, and an abdominal binder is fastened tightly from above downwards to press the side walls of the uterus against the vaginal dam, and thus completes the operation. A plug so applied will cause immediate cessation of hæmorrhage, and when it is removed after the lapse of hours so much blood only will be found as can be accounted for by the flow that took place during the operation.

Various explanations have been given of how the plug acts, and many of these by their ineptitude have greatly prejudiced the method of treatment. Many suppose that a back pressure on the blood-vessels is caused by the outpoured blood above the plug. This explanation is quite inadequate, and justifies Berkeley and Bonney in writing that "on first consideration the logic of plugging the vagina to arrest bleeding that is going on some distance above it may not appear obvious, yet its efficacy in cases with free external hæmorrhage is proven." These writers satisfy themselves that the efficacy of the plug depends on it increasing the power of the uterus to contract. When dealing with concealed accidental hæmorrhage, however, with the accompanying uterine inertia, they are driven to express a doubt whether the plug can have any directly useful effect. They say "it is easy to apply" and that it "has this great advantage, that it avoids rapid emptying of the uterus, a proceeding which always impresses severe shock on these patients. We think there can be no doubt that in some of these cases the bleeding has stopped by the time the practitioner comes on the scene, and that in such plugging the vagina has the great advantage of compelling him to pursue a course of masterly inactivity."

No doubt a plug applied in the method recommended by these writers will produce very different results from one applied in the way described above. They apply the plug with the aid of a speculum and a forceps, and use for this purpose rolls of cotton, each tied round with a string to facilitate removal. I feel sure it would not be possible to place in position one dozen of such rolls as are portrayed in their illustration. The plug, as I understand it, should consist of from 20 to 40 separate pieces, packed and dovetailed so closely into each other that they could not possibly be removed by pulling on them with a string.

I have quoted from the work of these writers to show how much, even now, the correct action of this device is misunderstood, and how much the method of treatment has suffered in consequence.

In 1898 I laid before this section of the Academy evidence to show that the plug acted directly as a compressor of the uterine vessels. Recently I have re-read that article and still cannot understand how anyone who took the trouble to weigh carefully the evidence I then adduced could have any doubt as to the truth of my contention. In the report of the discussion on that paper I find that, with the exception of Dr. Doyle, a general practitioner, all the speakers either ignored the suggestion altogether or treated it with contempt. It is therefore not surprising that the suggestion has not received general recognition in other countries. If truth could be destroyed by means of a studied boycott, assuredly this one would have shared that fate.

After nearly 20 years I am able now to bring forward positive proof that the plug acts in the way I have suggested. During the performance of several Cæsarean sections, after the delivery of the child and the stitching of the uterine wound, I have got an assistant to pass his hand into the vagina and to press it into the lateral fornix. In each instance his hand has formed a prominent convex tumour, which can be seen from the abdominal wound to press the base of the broad ligament upwards above the level of Poupart's ligament. On this tumour the uterine vessels lie, and I have been able to demonstrate to my colleagues, Sir William Smyly, Dr. Purefoy, and my Assistant Masters, that

[1] A paper read before the Obstetrical Section of the Royal Academy of Medicine in Ireland on April 20th.

the pulsation in these vessels is stopped by the pressure. On the last occasion I asked my assistant to tell the class what he felt. First he said the pulsation in the artery had ceased, and when I pressed the fundus of the uterus downwards to reproduce the conditions induced by the abdominal binder he said his finger had become nipped between the resistance below and the side wall of the uterus. If we remember the size and importance of the blood-vessels, both ovarian and uterine, which are situate in this region, the result of direct pressure exercised on them by a tightly fitting vaginal plug will at once become apparent.

In labour the opening of the internal os removes from the lateral fornices the support that it formerly afforded, and so allows the fornices to be pushed far up into the abdomen. In the non-pregnant state this cannot be done on account of the tightness of Mackenrodt's ligaments. These ligaments are really the tendons of the uterus. They are under the control of the uterine muscle fibres. It is the uterus by its inherent power, acting through these so-called ligaments and its other tendons, that forms the true floor of the pelvis. This is another truth of vital interest to the gynæcologist which I trust will not in its turn lie dormant for 20 years.

The vaginal plug is not easy to apply, nor is its application harmless. Sometimes, in spite of our best efforts, we cannot at the first attempt insert sufficient material to stop the bleeding. In such a case the plug must be removed entirely and then reinserted. On the second attempt the procedure will be found to have become much more easy on account of the dilatation of the vagina. Pain, distress, and some shock always follow from the application of the plug, and superficial tearing of the mucous membrane of the vagina is almost certain to occur.

It is clear that the words "vaginal plug" mean, in Dublin, something different from what they do elsewhere, and when one criticises the method of treatment one must bear the true meaning in mind.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

A CASE OF PLACENTA PRÆVIA AND TWINS.

BY W. GRAHAM REYNOLDS, M.R.C.S. ENG., L.R.C.P.LOND.;
AND
J. O. THOMSON, M.D. MCGILL,
SURGEONS, CANTON HOSPITAL.

OWING to its exceptional character, the following case may be worth recording.

The patient, a Chinese woman, aged 30, multipara, was sent into hospital with a history of there having been several severe gushes of blood. There had been no labour-pains, so that it was not possible to say when labour had started. Two previous confinements had terminated naturally. The patient was a strong healthy woman, of the farmer class. On examination the pulse was found to be strong and normal. The head was presenting; no fœtal heart was heard. Per vaginam the placenta was found to be centrally placed and the head presenting. The question of Cæsarean section was discussed and decided against, as the child was thought to be dead, and also we could not be sure as to who had examined previously. The os admitting two fingers and the cervix being soft and easily dilatable, it was thought that version and rapid delivery would offer the best chance for the mother, as, if there was any difficulty in delivery, perforation and extraction could be performed. Two fingers were accordingly introduced and bipolar version attempted; great difficulty, however, was experienced in turning the child. The cervix proving very easily dilatable, it was stretched with the fingers, the hole through the placenta enlarged, and a hand introduced, and first one and then the other leg was brought down. Quite gentle jaw traction was sufficient to deliver the after-coming head. The hand was reintroduced and the placenta removed. It was noticed, per abdomen, that after the child was born there was still a mass seemingly occupying the uterus. The hand introduced to peel off the placenta discovered a second fœtus, also with the head presenting. A leg was brought down and the fœtus delivered; there was a separate placenta, normally placed, which was delivered manually. The uterus contracted well, and the patient was returned to bed in good condition, not having lost much blood. The first child, though in a state of "white asphyxia," breathed well after some 15 minutes' artificial respiration had been done; the second child was quite dead, and had been so probably for a day or two. Both were males. The mother had a normal puerperium, and left the hospital with her child on the tenth day.

The chief points of interest in this case are the bilocular twins, one placenta being normally placed and the other centrally over the internal os, and the ease with which the os dilated from the size of a florin to a size sufficient to admit of the passage of the first child. There was no tear either in the cervix or the vagina.

Canton, China.

CASE OF TETANUS TREATED BY INTRA-MUSCULAR INJECTIONS OF ANTITOXIN.

BY G. H. V. APPLEBY, M.D., B.HY. DURH.,
ASSISTANT SURGEON, HARROGATE INFIRMARY.

IN view of the recent discussion of the methods of treatment of tetanus by antitoxin the following case may be of interest. The notes were taken by Mr. S. A. Faulkner, house surgeon, Chalmers Hospital, Edinburgh, and lately house surgeon, Harrogate Infirmary.

Patient was admitted to Harrogate Infirmary on Nov. 14th, 1916, suffering from a deep and jagged wound, 5 inches long, of the hypothenar eminence of left hand caused by a hay-chopper. The wound was dressed and the patient retained in hospital. No prophylactic injection of antitoxin. As wound was far from clean continuous eusol baths were ordered. On Nov. 23rd, ten days after admission, twitching of left leg with tonic contractions of both recti and slight opisthotonos. Patient was at once given antitoxin serum U.S.A., intramuscularly, 1500 units, and 20 c.c. of 10 per cent. sol. of mag. sulph. subcutaneously; these were continued during next five days. On Nov. 24th the symptoms were more pronounced; profuse sweating; risus sardonicus well marked and difficulty in swallowing. Temperature subnormal; it had been so after second day of admission and did not rise with onset of tetanic symptoms. Pulse remained about 80; respirations 24. On Nov. 28th temperature rose to 100° F.; pulse 100; respirations 28 and very laboured. Abdominal muscles contracted like a board. Patient was unable to swallow; clonic contractions of muscles of both legs and arms. Chloral hydrate was given per rectum, and antitoxin increased to 8000 units daily for three successive days (Nov. 28th, 29th, 30th). On Nov. 30th marked signs of improvement. Temperature normal; pulse 80; respirations 24 and less laboured. He could swallow, though with difficulty. Antitoxin again reduced to 1500 units, and continued daily together with injection of mag. sulph. until Dec. 20th. Patient continued to do well, the spasmodic contractions gradually abated, though the recti and abdominal muscles remained obstinately contracted well into convalescence and after the wound was soundly healed. He was discharged well on Jan. 3rd, 1917.

There is little doubt that in this case the initial doses of the antitoxin were too small, and that the very much increased doses had a quick and marked effect. Another point noticed was the persistence of the contraction of the abdominal muscles.

SOCIETY FOR RELIEF OF WIDOWS AND ORPHANS OF MEDICAL MEN.—The annual general meeting of this society was held on May 18th, at 11, Chandos-street, W., Sir Alfred Pearce Gould, the President, being in the chair. From the annual report it appears that the invested capital of the society amounts to £140,000, and £4223 13*s.* 11*d.* were distributed during the year amongst the 48 widows and 9 orphans who are in receipt of grants. The working expenses amounted to about 4½ per cent. of the income, practically the whole of the income of the society being spent on the grants; but although nearly 7000 medical men are eligible for membership of the society, as residing within a 20-mile radius of Charing Cross, barely 300 are members. The President, commenting on this fact, said he quite realised that the young medical man just qualified thought he could never fail to rise to the top of his profession, but it only needed to attend the meetings of the court of directors to realise that in many instances these hopes were not attained.

Reviews and Notices of Books.

Medical Bacteriology. For Practitioners and Students. Edited by Dr. L. A. TARASSEVITCH. In three parts of 428, 700, and 200 pages respectively and an Atlas of Microphotographs in 16 plates. Petrograd and Kieff. 1912–1915. Price 17*s.* 8*d.*—This is a large text-book on bacteriology in Russian, to which 36 writers have contributed, including the preface by Professor Metchnikoff, the whole being under the editorship of Dr. Tarassevitch, of Moscow. Apart from the monumental work of Kolle and Wassermann, no other bacteriological treatise reaches the dimensions of Dr. Tarassevitch's work, which is original throughout. Each part is written by a specialist, and includes the best known Russian bacteriologists, such as Omelianskij, Tchistovitch, Wladimiroff, Zabolotny, and Korschun. Among the younger generation appear the names of Yakimoff, Klimenko, and Padlewsky. From the Pasteur Institute in Paris the Russian workers Besredka, Weinberg, Shoukevitch, and Romanovitch are important contributors. The life-history of all the pathogenic organisms is fully and critically described, and at the end of each chapter there is a general survey of the pathological lesions produced. Immunity reactions are exhaustively dealt with, the most recent phenomena in this involved field being adequately treated. Although some of the authors show a tendency to dogmatise a little more than is justifiable, it will be found in general that the work is excellently done. The supplement contains a special chapter on the infective diseases of plants and epizootics. It has been the aim of Dr. Tarassevitch to make the work exhaustive and at the same time practical, and he has succeeded in bringing out an eminently satisfactory text-book. Most encyclopædic works suffer from the defect that the various authors do not adopt the same methods of treating their respective subjects. In Tarassevitch's "Medical Bacteriology," however, a singular uniformity has been preserved. Although many Russian investigators have made great names for themselves during the bacteriological epoch in medicine this work in its completeness and magnitude will come rather as a surprise to a generation who has believed that it is only the German works that count, and it shows the high standard of medical intellectual culture in a country which has been to a large extent neglected in Western Europe. Accustomed to the high price of English medical books, the price of Dr. Tarassevitch's treatise must appear remarkable.

Les Fractures de l'Orbite par Projectiles de Guerre. By FELIX LAGRANGE, Professor in the Faculty of Medicine, Bordeaux. With 77 figures in the text and 6 plates. Paris: Masson et Cie. 1917. Pp. 222. Price 4 francs.—Professor Lagrange has written a very valuable précis of the war injuries to the eye under the misleading title, "Fractures of the Orbit." Many of his observations, which are founded upon an extensive experience at an important base hospital, are original, are discussed with a thorough knowledge of the pathology of the eye, and demand full recognition from ophthalmic surgeons. They are likely to overlook the importance of this small book, so inadequately described in the title, and it is therefore the more important to draw attention to the outstanding features of its contents.

Successive chapters deal with the surgical anatomy of the orbit, general considerations on the etiology of fractures of the orbit, fractures of the orbit with conservation of the eyeball, fractures of the orbit with destruction of the eyeball, treatment of orbital fractures, treatment of ocular complications, and reparative surgery. Many of the injuries of war, of course, resemble those met with in civil life, are due to similar causes, and require similar treatment. These are adequately discussed, with the citation of many illustrative cases, by Professor Lagrange. Of greater value are the original observations, the accuracy of which will for the most part be confirmed by the experience of British ophthalmologists. Thus it is pointed out that the direct injuries of war do not cause fractures of the roof of the orbit and implicate the optic foramen or sphenoidal fissure by irradiation, as is so commonly the case in fractures of the base of the skull in civilian life. The latter are generally caused by falls upon the head or severe blows directed downwards upon the vertex of the skull, injuries rarely met with in war. When the eye is directly struck by a projectile it is generally hopelessly disorganised. Slighter injuries are due either to the penetration of minute metallic fragments or to concussion. A projectile passing in the immediate vicinity of the eye causes severe injuries by concussion. Most of the ordinary effects of concussion, such as iridodialysis, traumatic cataract, dislocation of the lens, and so on, are frequently seen. Professor Lagrange has never seen an ordinary rupture of the globe in the intercalary region. We can confirm this observation, but possibly such cases do occur and the eyes are excised before the patients reach the base hospitals. Lagrange has seen many detachments of the retina, which does not altogether accord with our experience. He is certainly right in his remarks on the frequency of ruptures involving both retina and choroid. These are rare in civil life, whilst choroidal ruptures are common. Retino-choroidal ruptures are followed by the development of masses of cicatricial tissue in the fundus which are very familiar to those who have seen many war injuries of the eye. The repair of cicatrised and distorted sockets and of the ghastly ravages produced by war wounds of the face is one of the most trying tasks of the surgeons at the base. Professor Lagrange writes very enthusiastically of the value of fatty and cartilaginous grafts, especially of the latter. The book is admirably illustrated by very clear diagrams and excellent half-tone blocks of fundus conditions.

JOURNALS.

The Indian Journal of Medical Research. Vol. IV., No. 3.—This is a specially good number, and it is notable, moreover, for the beauty and excellence of its many coloured plates. It contains an abstract of the address delivered by Surgeon-General Sir Pardey Lukis before the Indian Section of the Royal Society of Arts, on the opportunities for medical research in India. Dr. R. Row, of the Petit Laboratory, Byculla, Bombay, describes a simplified technique devised by him of Bass's method of cultivating malarial parasites *in vitro*, along with some observations on the malarial parasites cultured by this technique. This paper is illustrated by seven coloured plates and numerous charts. A note on flagellate dysentery is contributed by Dr. S. C. Chatterjee, assistant professor of pathology at the Medical College, Calcutta (with five coloured plates). Captain H. E. Shortt furnishes notes on two hæmogregarines of cold-blooded vertebrates, illustrated by two coloured plates. The next two papers are by Major Clayton Lane in continuation of his previous work on intestinal parasites, the first relating to *Bunostomum kashinathi* and the Ankylostomidæ (with four plates); the second, a short paper, is entitled "Are *Echinostomum malayanum* and *Artyfechinostomum sufrartyfex* Identical?" The report of a special investigation conducted under the auspices of the Indian Research Fund Association, on dysentery in the jails of Eastern Bengal, is supplied jointly by Major J. Cunningham and Captain H. H. King. This contribution extends to 56 pages and is illustrated by photographs, maps, and charts. A study of entamœbic cysts is contributed by Captain R. Knowles, I.M.S., of the Bombay Bacteriological Laboratory, in conjunction with Captain A. F. Cole, R.A.M.C., of Cumbala War Hospital, Bombay. This paper is illustrated by four coloured plates and a number of charts and tables. Two editorials complete the number, the first dealing with a new species of Anopheline, *Myzorhynchus similis*, sent from the Malay Peninsula by Mr. Richardson, travelling entomologist, the second being a summary of current medical research in Germany, compiled from various German periodicals for the benefit of those workers in India who have a difficulty in obtaining current German literature in war time. This summary, among other things, deals with typhus, cholera, influenza, pyrexia of unknown origin, &c.

Revue de Chimiothérapie et de Médecine Générale. 1e ann. No. 1, Jan.-Févr., 1917. Rédaction: 2 rue de Rivoli, Paris.—We are asked by Dr. J. Laumonier, rédacteur-en-chef, to announce the issue of this review of chimiotherapy, a new science, we are told, "which Germans had accaparated for their own benefit," notwithstanding that two French physicians, Dr. Dujardin-Beaumetz and Dr. Bardet, had been, about 20 years ago, its true inventors. The number contains three abstracts from American journals, an article by Dr. Henri Bouquet on the present position of antitetanic sero-therapy, a review of the chimiotherapy of tuberculosis signed J. M., and chiefly dealing with cyanocuprol, and an original article by the editor on colloidal iodine furnished by Messrs. E. Viel and Co.

THE LANCET.

LONDON: SATURDAY, JUNE 2, 1917.

Heliotherapy.

FOR many years the Continental medical press has contained more or less scientific contributions on the subject of heliotherapy, and only the overpowering importance of all subjects connected with the war has preserved sun-treatment from the unbalanced puffs of the amateur physician in the lay press at home and abroad. But in the case of sun-treatment publicity has distinct advantages. Scientific heliotherapy is still in its infancy, and even the physicians best qualified to give an opinion admit that they are, so to speak, groping in the light, and that the element of empiricism in their procedure is still very great. Two recent discussions in Christiania and Gothenburg have clearly shown how insecure the scientific basis of heliotherapy still is. Some speakers in Christiania characterised the heliotherapy practised in certain quarters as but little more than a well-advertised business undertaking, and suggested that the flood of "before" and "after" illustrations was over-flowing and calculated to give the misleading impression that heliotherapy is a panacea. Other speakers joined issue over the physics of heliotherapy, and the opinions expressed as to the comparative value of sunlight and the various artificial lights were also conflicting. Nor need we be surprised at this, for even on small practical points in sun-treatment there are quite divergent views. Some authorities, for example, regard rapid bronzing of the skin as highly desirable and beneficial, while others see in excessive pigmentation a screen, depriving the body of some of the most valuable constituents of sunlight. Nothing but exhaustive observation can decide where truth lies.

But though stress on our ignorance of the processes occurring in the body as the results of insolation must be confessed, as well as the elementary character of heliotherapy as practised to-day, it would be unjust to ignore the recent pioneer work in this field by Dr. A. ROLLIER and others. ROLLIER, in particular, has earned our gratitude by elaborating a well-regulated system, by insisting on accuracy of dosage, by directing attention to idiosyncrasy of the individual, and by emphasising the dangers of indiscriminate practices. A perusal of his well-known and beautifully illustrated text-book, "Cure de Soleil," will convince the reader of the care with which ROLLIER hedges in his procedure. But the average patient no more dreams of taking his sun-baths according to medical prescription than of regulating his breakfast by other dictates than those of common-sense. Physicians at seaside resorts are familiar with the consequences of sun-bath orgies, for "beach fever" is no rare complaint in the holiday months. At the present stage it is urgently necessary that the dangers of heliotherapy should be recognised and preached; the antics of the crank are calculated to damn this valuable remedy more effectively than the most stodgy indifference. He is to be found by the score in every bathing resort, exposing to the sun by the hour his head and neck—the parts of the body most vulnerable to sunlight. Or, emerging from the shades of a London office, he starts his course of "heliotherapy" with several hours' exposure of most of his body. Little wonder if he returns to work a few weeks later listless and irritable, with a blistered skin and an aching brow. Some years ago a German writer called attention to the ill-effects of self-administered heliotherapy in an article in which he drew a well-defined clinical picture of nervous exhaustion and irritability. Many of our readers may be consulted concerning sun-treatment in the course of the next few weeks, in which case they will be well advised to recall the existence of quite serious conditions that may be induced by injudicious exposure to the rays of the sun.

The Swiss mountain health resorts offer admirable facilities for heliotherapy, and encouraging reports are coming in from other countries blessed with a less prodigal wealth of sunshine. In Norway, for example, heliotherapy has been adopted as part of the sanatorium régime by Dr. HOLMBOE at Mesnalien, and his verdict in cases of pulmonary tuberculosis in every stage when submitted to heliotherapy is favourable. The euphoria following the exposures was often so great, even in cases of advanced disease, that the patient was apt to exceed the prescribed limits. HOLMBOE adopts the cautious dosage recommended by ROLLIER in surgical tuberculosis, the first exposure being of the feet and ankles only and limited to a period of five minutes. In the course of about eight exposures he works up to a maximum of 4½ to 5 hours a day, the whole body, except the head, being treated. In this country heliotherapy has hitherto been at a discount. Yet it is not such a fog-bound island as the continental tradition would have it, and many a golden opportunity for turning the sun to account is undoubtedly lost. The institutions in which a properly planned solarium exists are, indeed, few; but it is to be hoped that when we emerge from this war heliotherapy will be introduced into the routine of sanatorium treatment. Already Mr. H. J. GAUVAIN[1] has shown at Alton that heliotherapy is a practical proposition in this country, and it is satisfactory to note that he is not blindly practising heliotherapy by rule of thumb, but is evolving and testing theories which may help to place this treatment on a more rational basis.

Medicinal Plants.

SERIOUS dislocation of important industries must always be reckoned among the inevitable results of hostilities in any part of the world, and it is only natural that efforts should be made to counterbalance and reduce the inconvenience at the earliest moment. While in this country the most pressing trouble lies in problems connected with

[1] THE LANCET, 1917, i., 653.

food-supply, the work of many surgeons, physicians, and pharmacists has been hampered by the war. Surgeons have found difficulty in replacing instruments, while physicians and pharmacists have similarly had trouble in making good the shortage of many synthetic remedies formerly derived from Germany. In addition there has been considerable inconvenience in pharmacy owing to the divergence into more important channels—munitions—of many articles previously largely employed in medicine. Therefore the supply of medicinal plants is attracting a great deal of attention at the present time, and we publish this week a note by a practical grower on their cultivation. The matter also formed the subject of a recent lecture at the Royal Society of Arts by Mr. J. C. SHENSTONE, F.L.S., and in the course of his remarks he emphasised the need of careful and continuous attention to scientific culture and economic organisation if herb-growing was to be of any real service to anybody. He admitted that much of the work would be of an experimental nature, to determine whether, under cultivation, the amount of active principle could be increased, though the value of home-grown medicinal plants might be much appreciated by war conditions.

To adapt ourselves to war conditions forms a part of the necessary process by which we all have to learn to share in helping to win the war. Manufacturing chemists have thus been stimulated to produce the equivalent of many synthetic remedies which were formerly imported, and it is to be hoped that in post-war conditions these new compounds will hold their ground against the inevitable foreign competition. The production of synthetic remedies must always remain in the hands of skilled pharmaceutical chemists, and it affords no outlet for the well-meaning efforts of the amateur. But the growing at home of medicinal plants was seen at once to give him a possible chance. Indeed, a promising field of energy was found in the attempt to popularise the collection and the cultivation of plants to be used as medicines. But the most earnest advocates of this movement admit regretfully that the number of indigenous plants officially recognised in this country is remarkably small, though they point to the plants used in France and in the United States as indicating that our employment of herbal remedies is unduly restricted, seeming to hope that an increased or varied supply of remedies will create a demand. Meanwhile it is realised that there are certain dangers in leaving the task of collecting in the hands of the untrained, and with a view to indicating where these dangers lie a charming little book on "Herbs Used in Medicine," with excellent coloured plates, has been published by the National Herb-Growing Association. Even in this small volume several plants which are not official are depicted, and the reader is referred to the two volumes, printed in 1790, of Dr. WOODVILLE'S "Medical Botany," with plates of all the medicinal plants then official. He will then see that it is possible that our whole outlook on the subject has been too narrow.

Undoubtedly very many vegetable drugs have been discarded since 1790. Remembering this, but knowing also that it has been prudence and not prejudice which has dictated the scientific attitude, we fear that an attempt to revive interest in home-grown pharmaceutical plants is doomed largely to disappointment. They have been tried and found wanting. Modern tendencies amongst medical men point to a form of treatment based upon an intimate knowledge of pharmacology, and the vegetable drugs which are retained in most instances have had to justify their existence as remedies by the presence of some definite alkaloid or active principle. If the activities of the National Herb-Growing Association are limited to the encouragement of an increased supply of herbs possessing alkaloids or active principles it is possible that a glut in the market may be produced speedily. On the other hand, it is very probable that, owing to improper methods of cultivation, a large amount of trouble will be expended without any corresponding advantage, as it is well known that medicinal plants require many peculiar conditions of soil and climate before they can attain the standard required by authority. With adequate care and knowledge these difficulties may be overcome, but the conditions cannot be met by enthusiasm alone. They demand special training and considerable expenditure, facts which were recognised by Mr. SHENSTONE in his lecture, in which he pleads for a Government Department entrusted with funds. We would not for a moment be found damping down the fires of a well-intentioned energy, but the article from a practical grower, to which we have already referred, reinforces Mr. SHENSTONE'S lesson that both money and expert knowledge are called for if the result of the growing of medicinal plants in this country is to be relative to the labour put forth.

Annotations.

"Ne quid nimis."

ATMOSPHERIC POLLUTION: A SENSIBLE GOVERNMENT GRANT.

THE Committee for the Investigation of Atmospheric Pollution has been constituted an "Advisory Committee on Atmospheric Pollution" to the Meteorological Office, and the advantages likely to result from obtaining a continuous record from year to year of the state of the atmosphere as regards suspended impurity have been recognised by a Government grant of £500, allotted by the Department of Scientific and Industrial Research, and designed to cover the cost of the work of the committee for the current year. The grant is intended to defray the expenditure of the Advisory Committee only, and was given on the understanding that the cost of gauges, collection, and analyses should be borne by the authorities which coöperate by setting up observing stations. Provision has been made for the nomination by each coöperating authority of a person for appointment as a member of the Advisory Committee. The action of the Department of Scientific and Industrial Research in making the grant was

only taken after full and careful consideration of the public advantages likely to accrue from the continuation of the work even during the war. At the same time, and since the value of the investigation depends on there being a sufficient number of observing stations, it was indicated that every effort should be made to maintain existing stations and to increase the scope of the movement, which has throughout received all the assistance which this journal could afford it. The collection, compilation, and publication of exact statistics on the suspended impurities of the air has a valuable function and supplements the study of all problems relating to fuel economy and smoke prevention. The reports for the years 1915–16 and 1916–17, forming the second and third annual reports of the committee, will shortly be published. Full information as to method of working at observation stations, with standardised instructions and blank forms for returns, can be obtained from the honorary secretary of the society, Dr. J. S. Owens, 47, Victoria-street, London, S.W. Since November, 1914, the returns in the form of a table, under the heading of "A Monthly Record of Atmospheric Pollution," have regularly appeared in our columns (those for the months of October and November, 1916, appear this week), and reprints are distributed to the committee and workers.

HYPOTHERMY AS AN EPILEPTIC EQUIVALENT.

IN the *Paris Médical* for May 12th, 1917, Dr. P. Carnot and Dr. A. de Kerdrel record a curious case coming under their observation at one of the neurological centres organised by the medical staff of the French Army.

The patient was a sergeant of the Chasseurs Alpins, aged 24, who was wounded on Sept. 16th, 1915, by a bullet which struck his forehead above the left eyebrow. Two hours later he was trephined. He is said to have remained unconscious for some 15 days, and on recovering his senses he found he was completely paralysed on the right side, but was able to speak. In the course of a month or more the hemiplegia gradually disappeared. Seven months after the date of the injury the patient suddenly had a fit of Jacksonian epilepsy, beginning in the right arm and becoming generalised; its duration was a quarter of an hour. Twenty-seven days later he had a second attack, beginning in the fingers of the right hand, and following the usual march up the arm and down the trunk and right leg. When he came under the observation of the writers he was seen to have a pulsating depression two finger-breadths above the outer end of the left eyebrow, pressure on which, however slight, produced an unpleasant feeling of malaise and painful radiating sensations referred to the right arm. There was slight general weakness of the right arm and slight diminution in sensibility in the same distribution. The rectal temperature was normal. A few days later a remarkable lowering of the temperature took place in a progressive fashion: from 36·7° C. (98° F.) it went gradually down in the course of three days to 34·4° C. (94° F.), rising again almost to normal in some 24 hours. Two days later another Jacksonian fit occurred of the same typical kind as before. On this occasion, however, repeated slight attacks also took place involving the right arm only, followed by paresis of the arm. On this occasion, further, the contractions in the arm were very painful, a condition which had not been remarked before. Some five or six days later the temperature began to fall again, and went down to 34·2° C. (93·5° F.), again gradually rising in the course of two or three days; a brief attack occurred at that time, influenced, no doubt, by the bromide treatment which had been instituted. This treatment also was responsible for the curtailing of a third phase of hypothermy and painful tingling in the right arm, without twitching, which developed some 14 days later. On the suggestion of Professor Sicard, in charge of the neurological centre, the patient's wound was reopened and the cicatrix was found to be adherent to the underlying gyri. It was completely freed, and thereafter the attacks of Jacksonian epilepsy and the hypothermy both ceased.

The question of heat "centres" in the nervous system is still the subject of much discussion among physiologists. Clinical evidence is abundant but conflicting. Cerebral lesions not infrequently produce a state of marked thermic disequilibrium. Sir William Gowers recorded a case of thrombosis of the basilar where the temperature rose to over 109° F., repeatedly verified. On the other hand, Janssen has reported a temperature of 87·2° F. in a case of general paralysis. Further, remarkable changes in body temperature occur after traumatic lesions of the spinal cord, and these vary with the level of the lesion, as has been shown by Gardiner and Pembrey in a series taken from the Guy's Hospital reports over a period of 50 years. There is, also, some evidence to suggest that in epilepsy an "attack" of hypothermy or hyperthermy may be of the nature of an epileptic discharge—an epileptic equivalent. In the present case the association between the two is curiously significant. The interpretation of these and other thermic phenomena may be difficult, but the subject is one deserving further study and investigation.

BACK TO THE LAND AND THE WAGES QUESTION.

THE National Housing and Town Planning Council has issued, in the form of a letter addressed to individual Members of Parliament, a pronouncement of its views upon the subject of the weekly wage contemplated for the agricultural labourer by the Corn Production Bill. Its main proposition is that the suggested minimum wage of 25*s.* is inadequate, and does not represent for the labourer an advantage corresponding to that offered to the farmer with the object of increasing the country's production of food. The Council does not put forward an amount to be substituted, but suggests that even the 30*s.* per week asked for by the National Agricultural Labourers' Union will prove insufficient. This opens up a serious prospect for those responsible for the national finances after the war, and for the promotion of agriculture under conditions to be brought about by statute, but as 25*s.* constitutes a rise of over 100 per cent. for the labourer in two counties, according to the statistics relied upon by the National Housing and Town Planning Council, and as in few areas will an increase of less than 100 per cent. be represented by a weekly wage of 30*s.*, it is clear that drastic reform is called for. The sums given as the "total earnings" of the labourer before the war, amounts which presumably include harvest money and like bonuses, will probably have to be raised by increasing these extra payments upon a scale corresponding with the increase in wages, for it can hardly be expected that they will be foregone, and their value as the rewards of industry will have depreciated as much as that of the weekly wage. The question of adequate agricultural wages will have to be faced and a decision arrived at, for the importance of it is evident, and the arguments put forward in the letter of the National Housing and Town Planning Council are clearly stated, whatever conclusion of assent or dissent be arrived at after perusing them. The aim of the legislator, in addition to that of providing for our future food-supply, will be to keep good workmen on the land and to tempt good workmen to return to it from the towns to which they have migrated, driven thither to a large extent by bad wages and bad housing accommodation in past generations—grave errors for which we are now about to pay. The matter of housing accommodation naturally receives prominence in the Council's letter, and from 5*s.* 8*d.* to 7*s.* 1*d.* are the weekly

rentals which it regards as necessary if cottages of a suitable character are not to be built at a loss to those providing them. The increased price of food and other commodities, together with the prospect of such prices being long maintained, is the other element in the calculation, and here also the National Housing and Town Planning Council presents a case deserving careful consideration by the legislature. The Council considers that the minimum wage proposed is inadequate, and that a degree of benefit is promised to the farmer which is denied to the labourer. That something short of the increase suggested by the Council's letter may be found adequate is possible, but it is of vital importance to bring the workman back to the land, to live there in healthy circumstances and to breed a stalwart race that will repair the ravages of war. To medical men, to eugenists, and indeed to all thinking persons it is inconceivable that such a policy should be defeated by the costliness of the means for attaining it.

HÆMATURIA FROM RIDING.

IN the *Medical Review* for May attention is drawn to a cause of hæmaturia which is not generally recognised—riding. This contingency is of special interest at the present time as the subjects were medical men who were learning to ride, evidently for the purpose of undertaking military work. Two cases have been recorded by different German writers. The first is reported by Grünbaum[1]:—

A medical man, aged 32 years, was given his first riding lesson on June 8th. The next day he rode for half an hour without stirrups on a rearing horse. About two hours later he noticed that his urine was scanty and of a reddish-brown colour. He also had the usual pains associated with the first riding lessons. He took a bath and about three hours later collapsed and had to go to bed. He was a perfectly healthy man, whose urine previously had been normal. Examination now showed 0·05 per cent. albumin, a few granular and hyaline casts and a few erythrocytes. On June 10th the albumin had increased to 0·1 per cent., and there were numerous granular and hyaline casts with a few erythrocytes. Next day, in addition to the constituents mentioned, leucocytes, epithelial cells, and a few epithelial and blood casts were demonstrable. On June 12th there was no longer any albumin and the number of formed elements was much reduced. On the 15th microscopic examination showed nothing abnormal. No renal symptoms, such as œdema or cardiac complications, were present, and there was no sign of any infectious or cardiac complaint. The hæmaturia was therefore regarded as due to concussion of the kidneys.

The second case is recorded by Gast,[2] who was himself the subject.

Unaccustomed to violent exercise, he took lessons in riding. The riding-master, a non-commissioned officer, at once forced the pace, making him trot without stirrups. After the first day he ached all over and on the following day did not ride for so long. On returning he noticed that the urine was very red. Innumerable red cells and a few casts and other formed elements were found. Suspecting that the hæmaturia was due to concussion, he spent the afternoon and night in bed and took a light diet. Next morning there was no macroscopic sign of blood, but under the microscope red cells were still demonstrable, as well as a few hyaline casts, but they were far less numerous than on the previous day. He did not lie up, and in the next few days all trace of albumin and blood disappeared. A few weeks later he resumed riding lessons under a more sensible master and began more cautiously. Though he continued the lessons for weeks the renal symptoms did not recur.

Gast refers to Grünbaum's case, and considers that both cases show that it is not necessary for a soldier who develops hæmaturia after the first hours of riding to give it up provided the hæmorrhage is due to concussion. These cases also show the folly of forcing the pace in a course of riding lessons, as is often done in Germany. The jolting of the whole body when stirrups are not used is so severe that unless the exercise is graduated there may be ill effects.

[1] Münch. med. Woch. [2] Deut. med. Woch.

MEDICAL RESEARCH IN INDIA.

THE valuable paper read not long ago for Surgeon-General Sir Pardey Lukis by Sir Havelock Charles before the Indian Section of the Royal Society of Arts has drawn the attention of the medical public to the great progress which has been made in our knowledge of certain diseases in India, and also to the unrivalled opportunities afforded in that country for prosecuting medical research. He pointed out some of the many benefits conferred already upon mankind, especially in respect of tropical diseases, by Indian investigations. The discovery, for instance, of the spirillum of relapsing fever by Vandyke Carter at Bombay, opened out a new vista in connexion with the origin of specific fevers. The demonstration by Ross of the proteosoma parasite in birds, and his subsequent observation of a similar cycle of development of the malaria parasite, began a new era in the history of tropical medicine. Since then the detailed work carried out in India in connexion with the plague bacillus and the special investigations made concerning the cholera vibrio form valuable additions to the general stock of knowledge, and upon them have been based many of the practical measures formulated for the control and prevention of these diseases. No less important have been the recent contributions made in India in the field of scientific therapeutics, and in this connexion the methods of treatment of cholera, dysentery, kala-azar, and leprosy, recorded by Rogers in Calcutta, are deserving of special mention—examples which do not by any means exhaust the list. In the immediate future we may anticipate fresh discoveries as a result of the new research laboratories established in Bombay, Kasauli, and Madras. Two new schools of tropical medicine are being inaugurated at Bombay and Calcutta, and when the present world-wide war is over and the various professors and lecturers return to India from their military service it may confidently be expected that, by the education of native medical men in modern scientific methods of research, a fresh stimulus will be given to the investigation of those diseases of India the nature and origin of which are still obscure. The recruiting of the Indian Medical Service from the more highly qualified and earnest young practitioners of our own country may also be expected to assist, as in the past, in elucidating many medical problems in view of the special opportunities now afforded in India to competent investigators. The establishment in 1911 of the Indian Research Fund Association, generously endowed by Government, is likely to prove of great assistance to qualified experts who otherwise, on account of the cost, would be unable to carry out their protracted experiments. The *Indian Journal of Medical Research*, which is edited by the Director-General of the Indian Medical Service and the Sanitary Commissioner with the Government of India, and published by the Indian Research Fund Association, supplies a convenient and useful medium for making known to the scientific world the results obtained by these investigators. This journal is now in the fourth year of its publication, and already many important contributions have appeared in its pages relating to such subjects as malaria, plague, cholera, yellow fever, kala-azar, ankylostomiasis, dysentery, goitre, and leprosy, as well as the bacterial standards of tropical water-supplies, the cinchona derivatives, the flies and mosquitoes

of India, parasitic ticks, and the like. Some current investigations, we learn, have been interrupted by the war, but will be resumed as soon as peace is declared. In another column we notice the last issue, which is notable for its profuse and valuable illustrations.

A CASE OF PROGERIA.

PROGERIA is defined by Mr. Hastings Gilford[1] as "primary spontaneous infantilism mingled with premature senility." The premature senility is its most obvious feature, and only a few cases of it have been described. Dr. J. C. Schippers has recently reported[2] a new instance.

The patient, a boy weighing 6 lb. at birth (August, 1911), was the first child of healthy parents. He was fed at the breast for a time, but was always puny and had a disproportionately large skull with prominent veins on it. After the first year, when he had whooping-cough, his hair fell off; his first teeth appeared and he walked at 18 months, and at the age of 2 he talked. His mental faculties seemed normal, and he got on well with other children. Dr. Schippers first saw him in April, 1915; he was a slightly built child with a very large rounded forehead, brown ill-nourished skin, projecting eyes, bald and prominently veined head, slightly enlarged thyroid, and over-large joints. The thoracic and abdominal viscera seemed normal, and no evidence of arterio-sclerosis could be obtained; there was nothing found amiss with the nervous system or the urine. Examination of the blood showed slight anæmia, and over 9 per cent. of the white cells were eosinophiles. The head was 49 cm. in circumference, the chest 48 cm., and the child weighed 25 lb. Examination with the X rays showed a normal sella turcica and nothing abnormal about the ossification of the bones generally. Eighteen months later the child was seen again and was in much the same general condition. He was over 5 years of age, but the anterior fontanelle was still open; the head was 50 cm. in circumference, the height was 88 cm., the weight over 26 lb., and an Arneth blood-count gave normal results.

Dr. Schippers mentions as the chief features of this case the pigmentation and malnutrition of the skin, the prominence of the joints, the open anterior fontanelle, and the baldness, with greyness of the few remaining hairs. Photographs, indifferently reproduced, show the build, pigmentation, and aged look of the child; his facies recall that of the well-known case recorded by Mr. Hastings Gilford. Dr. Schippers discusses the pathogenesis of progeria, which remains obscure.

THE CENTRAL STATISTICAL BUREAU.

WE referred in our issue of May 19th to the vital statistics for 1915 at some length, for it is of the greatest interest to know how the first year of war affected the population as shown by official figures. The value of statistical information is to-day increasingly recognised, and we are glad to learn that for the future the Registrar-General will undertake the responsibility of furnishing local mortality statistics to the medical officers of health of the various sanitary authorities throughout the country. In this way they will receive an adequate record of vital statistics the trustworthiness of which is guaranteed by a Government department. That this important duty should be undertaken, as a matter of routine, by the central statistical bureau has always been the contention of THE LANCET, and it is hoped that the system, which was successfully inaugurated last year, may be continued permanently, with the abolition of overlapping. Indeed, adherence to former methods of estimating populations has been rendered impossible by conditions of war. Men of military age have been largely drafted to military training centres or have been sent abroad with the Army, and the remainder of the male adult population, as well as much of the female population, has migrated to an inordinate extent into areas other than those in which it had been enumerated in 1911. In these circumstances estimates, whether of total or local populations, on the basis of Census returns, were obviously inadmissible, and the National Register of 1915 became the best available substitute. The only local estimates attempted have been those of total civil populations in the several areas, based on the results obtained from the National Register. A new light on the difficulties encountered, as the result of war, in the estimation of local populations was supplied by Sir Bernard Mallet's presidential address to the Royal Statistical Society, which has been reprinted for private circulation. In this document, the extent to which local fluctuations affect the vital statistics of administrative areas is revealed in the statement, that "owing to the unprecedented dislocation of the population caused by the withdrawal of men of military age from civil life, and the demand for munition factories and war services, the data for calculating local birth-rates and death-rates with any approach to accuracy simply do not now exist." After acknowledging appreciatively the help already derived from national registration, he goes on to assert that, without annual revision, national registration can supply no basis for calculations in this and future years. Fortunately, however, the need for some kind of enumeration for statistical purposes, at the conclusion of war, is conceded by the majority of those whose judgment is entitled to respect.

POISONING BY RHUBARB LEAVES.

AT the resumed inquiry held by the Enfield coroner on Tuesday last into the death of a local minister of religion, Dr. B. H. Spilsbury, who made the necropsy, attributed the fatal issue to coma consequent on oxalic acid poisoning, the oxalic acid having been taken in the form of cooked rhubarb leaves. Mr. J. Webster, assistant analyst to the Home Office, stated that he had found oxalic acid in certain organs of the body and no traces of any other poison. Analysis of rhubarb leaves from the same ground as those eaten by the deceased showed the presence of calcium and potassium oxalates in quantity about 10 grains of each to the pound. Dr. Spilsbury characterised this quantity as a borderline amount sufficient to cause serious symptoms in certain people. The smallest recorded fatal dose of oxalic acid is given in text-books as 60 grains, and the soluble acid potassium salt is stated to be equally poisonous. Taken in concentrated form both act as violent irritants and quickly excite vomiting, by which some at least of the poison is expelled. Well diluted or taken with other food gastric irritation may be absent and nervous symptoms dominate the case, due to alteration of the calcium content of the blood. Combined with calcium oxalic acid is entirely inert. The coroner uttered a warning against the use of soda in cooking rhubarb stalks—an addition which has been recommended to neutralise the acidity and avoid the necessity of adding sugar—inasmuch as a soluble oxalate may be produced by its action. He might well have given the positive injunction to add a pinch of powdered chalk in the cooking, whereby the same end is attained with perfect safety.

[1] THE LANCET, 1914, i., 672.
[2] Nederl. Tijdschr. v. Geneeskunde, Amsterdam, 1916, ii., 2274.

THE GENERAL COUNCIL OF MEDICAL EDUCATION AND REGISTRATION.

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WEDNESDAY, MAY 23RD, AND THURSDAY, MAY 24TH.

THE Council resumed its sittings at its offices, 44, Hallam-street, W., Sir DONALD MACALISTER, the President, being in the chair.

Penal Cases.

The first case to be considered was that of Thomas Dixon Cook (adjourned from Nov. 29th, 1916[1]) on a charge of enabling certain uncertified women to attend women in childbirth in contravention of the Midwives Act, 1902.

At the conclusion of the hearing in November the President announced that the Council had found the facts alleged in the charge against the practitioner to be proved, but judgment was postponed until the present session.

Mr. Cook attended, and the complainants, the Central Midwives Board, were represented by Mr. J. Bertram, solicitor.

Mr. COOK made a brief statement in which he stated that since he appeared before the Council he had conducted his midwifery practice entirely in accord with the Council's requirements.

Testimonials from certain medical practitioners in Torquay were read stating that no fault was to be found with Mr. Cook's professional conduct since he appeared before the Council.

The PRESIDENT said: Mr. Cook, the Council having considered your assurances as to your future conduct and the testimony in your favour given by your professional brethren as to your conduct in the interval, does not see fit to direct the Registrar to erase your name from the Medical Register.

The next case was that of Edward White, registered as of 2, Green Park, Bath, L.S.A. Lond., 1893; M.R.C.S. Eng., 1900; L.R.C.P. Lond., 1900, who had been summoned to appear before the Council on a similar charge.

Mr. White attended, and the complainants, the Central Midwives Board, were represented by Mr. J. Bertram, solicitor.

Mr. BERTRAM, for the complainants, submitted three cases on which the complaint was framed. Mr. White, he stated, was not present at any of the deliveries, which were conducted by an uncertified woman, Mrs. Webb, and, as he was informed, the services rendered by the medical man of a medical kind were not very much more than perfunctory services. The engagement in all cases was not made by the patient or or behalf of the patient with the medical man, but was made by the uncertified woman, who said she would see that the doctor came.

Mr. WHITE addressed the Council on his own behalf and stated that he had no intention or desire to contravene the directions of the General Medical Council. It was quite true that Mrs. Webb was prosecuted, and he gave evidence in connexion with the three cases. His answer was that although he had not been present at the births, he had given his continued attendance subsequently. He had fully and carefully taken all the usual precautions and had kept in touch with the cases both by personal visit and by inquiries for about two weeks. In view of his continued attendances, he did not think he was "covering" an uncertified woman, and if he had done so, it had been done unintentionally. He was anxious to conduct his practice in conformity with the rules and wishes of the Council.

The PRESIDENT said: Mr. White, the Council has come to the conclusion that the facts alleged against you in the notice have been proved. These facts are that you by your assistance knowingly enabled Mrs. Elizabeth Webb, whose name had been removed by the Cental Midwives Board from the Roll of Midwives, to attend women in childbirth under cover or pretence that such women were attended or to be attended by you or by her under your direction, thereby enabling the said Mrs. Elizabeth Webb, in contravention of the Midwives Act, 1902, to practise as if she were certified thereunder. You so enabled her by notifying births, on her behalf, in cases attended by her, and by signing maternity benefit certificates which she was not qualified to sign. The Council, in the public interest, takes a very grave view of the danger which arises from a medical practitioner who lends his name for such a purpose, and "covers" the practice of unqualified persons, under whatever pretext they practise midwifery, and whatever may be his personal opinion as to their skill and capacity to attend women in labour. In order, however, to give you an opportunity of reconsidering your whole position in relation to this matter, the Council has postponed judgment in your case till the next session in November. Before that date you will be required to send to the Registrar of the Council the names of some of your professional brethren who may be willing to testify as to your character and conduct in the interval.

The next case was that of Henri Saturnin Hartley, registered as of 8, Sackville-street, Port of Spain, Trinidad, M.D. U.Laval, 1906, who had been summoned to appear before the Council on a charge of issuing certificates of successful vaccination without having seen, examined, or vaccinated the persons in question, and of having paid commission to the person who procured him to give the certificates.

The case was brought to the notice of the Council by the Medical Board of Trinidad.

Dr. Hartley attended in person and was accompanied by his counsel, Mr. J. H. Watts.

Mr. HARPER, the solicitor to the Council, explained the circumstances in which the charge was brought. The Medical Board of Trinidad held an inquiry into a charge practically identical with the one now brought forward, and as a result the practitioner's name was erased from the Medical Register of Trinidad. He read a petition by Dr. Hartley to the Medical Board of Trinidad for the restoration of his name to the Register of the colony which was refused.

Dr. HARTLEY gave evidence on his own behalf, denying the allegations.

At the conclusion of the hearing the PRESIDENT announced that the facts alleged against Dr. Hartley had not been proved to the satisfaction of the Council, and the complaint was accordingly dismissed.

The Council then considered the case of Andrew Robertson Dow, registered as of Silverhowe, College Park, N.W., M.B., Ch.B., 1902, U. Glasg., who had been summoned to appear before the Council on the following charge:—

That being a registered medical practitioner you were at the general session of the Central Criminal Court beginning on the 6th day of February, 1917, convicted of conspiring with other persons to defeat the provisions of the Military Service Acts, 1916, and were sentenced to nine months' imprisonment in the second division.

Mr. Robertson Dow attended and was represented by Mr. Ernest Wild, K.C., and Mr. Showell Cooper.

Mr. HARPER, the Council's solicitor, in bringing the case to the notice of the Council, put in the certificate of conviction. He said that the course which Mr. Dow had taken in the events which had led to the proceedings in court was to give three certificates to men who were seeking for total exemption from military service or to be placed in a lower category. In two cases these certificates stated that the man had been his patient for some time, which was contrary to fact.

Mr. ERNEST WILD, K.C., who addressed the Council on behalf of Mr. Dow, suggested that in the light of the small remuneration that Mr. Dow received for giving these certificates, and in the light of the diagnoses being honest diagnoses, he had been sufficiently punished for making a statement in the interest of his patients which was undoubtedly false. He appealed to the Council to give Mr. Dow one more chance.

The PRESIDENT (announcing the decision of the Council) said: Mr. Andrew Robertson Dow, I have to inform you that the Council have found it proved that you have been convicted of the misdemeanour alleged against you in the notice of inquiry and have directed the Registrar to erase your name from the Medical Register.

The Council adjourned.

FRIDAY, MAY 25TH, AND SATURDAY, MAY 26TH.

The Council resumed its sittings.

Penal Case.

The Council considered the case of Alfred Banks, registered as of Five Ways, Ryde, I. of W., M. 1891, F. 1893, R.C.S. Eng.; L.R.C.P. Lond., 1891, who had been summoned to appear before the Council on a charge of committing adultery with a patient whom he had been attending professionally.

Mr. Banks was not present, but he was represented by Mr. Hemmerde, K.C., and Mr. Le Bas. After hearing the case,

The PRESIDENT (intimating the decision of the Council) said: I have to announce that the facts alleged against Mr. Alfred Banks in the notice of inquiry have been proved to the satisfaction of the Council, and that the Council has adjudged Mr. Alfred Banks to have been guilty of infamous conduct in a professional respect and has directed the Registrar to erase from the Medical Register the name of Alfred Banks.

Reports of Committees.

Sir JOHN W. MOORE presented a report by the Public Health Committee on a new statistical table for the 10 years 1905-1914, giving the figures for the first examination and second examination for the qualifications in public health

[1] THE LANCET, 1916, ii., 987.

and on matters arising therefrom. The report stated that in the professional examinations held in 1916 for qualifications in sanitary science, public health, or State medicine the total number of candidates who presented themselves before all the examining bodies was 137. The figures for 1913 and 1914 were 626 and 589 respectively. These figures included both first and second or final examinations and passes and rejections. The report remarked that when now a qualification in medicine and surgery had been obtained there presented itself at once not merely an opening, but an urgent call, for the services of the new graduate for civil or military or naval work.

The report was formally received.

A report on exceptional cases was presented by the Students' Registration Committee.

The PRESIDENT submitted a report of the Pharmacopœia Committee. This report stated that the number of copies of the British Pharmacopœia, 1914, which were sold by the publishers between Nov. 26th, 1916, and May 19th, 1917, was 1099. The total number sold since May 20th, 1916, was thus about 28,134 copies. Of the second issue, published in May, 1915, about 450 remained in stock at the present date. The committee recommended that a third issue of 5000 copies should be ordered from the printers. The committee had had before them communications from a committee appointed by the Home Secretary to consider questions relating to economies in the use of drugs which, owing to the war, had become limited in supply. The communications referred in particular to official preparations containing glycerine and refined sugar. The committee recommended that the Council should delegate to them power to make on its behalf such official intimations on the subject as the existing conditions might render necessary. In briefly commenting on the terms of the report the President made reference to the restricted supply of sugar. It had been suggested to the committee that where possible there should be economy of sugar as an ingredient in preparations. If the Council would give the committee the power the latter would make temporary regulations.

The report with its recommendations was adopted.

A report of the Examination Committee was received on matters relating to the Apothecaries' Hall of Ireland.

Dr. KNOX moved the adoption of a recommendation of the committee to the effect—

That the Apothecaries' Hall be requested to continue to furnish the tables of exemptions from, and results of, examinations as heretofore, giving particulars of marks, and when the candidate had been previously examined by the Hall, and had passed some portion of the examination, the date of such examination. And that the report of Dr. William Taylor on the examinations held in December, 1916, be forwarded to the Apothecaries' Hall of Ireland for their information, with the request that they will favour the General Medical Council with any remarks they may desire to make, in time for the meeting of the Council in November, 1917.

Dr. MAGENNIS expressed the hope that the prolonged and exceptional inspections which he looked upon as persecution would not be continued.

The motion was agreed to.

Finance Committee's Report.

Mr. TOMES submitted the report of the Finance Committee, which showed that the income of the General and Branch Councils for the year ending Dec. 31st, 1916, was £7992 and the expenditure was £6997. That showed, said Mr. Tomes, that the financial position of the Council was satisfactory, and that there was a surplus of income over expenditure of about £1000. Owing to the conditions of the war there was considerable reason to anticipate that the next two years might be rather lean. The war had diminished the number of students who might take their qualification and registration, but later on the Council might hope to recover its receipts from the registrations which would take place in subsequent years. The Canadian medical men whose degrees and diplomas had been recognised here had to a material extent been absorbed in the Royal Army Medical Corps. Instead of registering some of them had taken it that being entitled to registration was the same thing as if they had actually registered.

The report was received.

Education Committee.

Dr. MACKAY intimated that the Education Committee did not bring forward a report this session. Last session certain changes as regards Latin were made in the preliminary examination which qualified for the universities. The question of Latin in the junior examination was remitted to the committee for further consideration. There was the question of the substitution of science for Latin in the junior school. The committee had been prepared to report on that subject, but the Government had appointed a committee to deal with the whole question of science teaching in secondary schools. In view of that fact the committee thought that it would be wiser not to bring forward the report now, but to hold it over to the next session.

Dental Representation on the Council.

Mr. THOMSON gave notice that at the next session of the Council he would move a motion in favour of legislation to secure direct representation of registered dentists on the General Medical Council.

Appointment of Committees.

The following committees were appointed:—

Examination Committee: Dr. Taylor, Dr. Elliot Smith, Dr. Caton, Dr. Russell, Dr. Cash, Dr. Norman Walker, Sir J. W. Moore, Sir Arthur Chance, and Dr. Kidd.

Education Committee: Dr. Norman Moore, Sir G. Philipson, Sir F. Champneys, Dr. Mackay, Mr. Hodsdon, Dr. Knox, Sir A. Chance, Sir B. Windle, and Dr. Dixon.

Public Health Committee: Sir A. Newsholme, Dr. Latimer, Mr. Verrall, Dr. Littlejohn, Dr. Cash, Dr. McVail, Sir J. W. Moore, Dr. Magennis, and Dr. Coey Bigger.

Dental Cases.

The Council, after consideration of a report of the Dental Committee referring to George Horatio Jones, who was registered in the Dentists Register on Oct. 8th, 1878, as "in practice on July 22nd, 1878," and whose address in the Register for the current year was Great Russell Mansions, Bloomsbury, London, W.C., directed the erasure of his name from the Dentists Register. The report had reference to certain advertisements.

The Council, after consideration of a report of the Dental Committee, directed the erasure from the Dentists Register of the name of James John Gordon Webster Clarke, who was registered on Dec. 24th, 1878, as "in practice on July 22nd, 1878," and whose address in the Register for the current year was 18, Waterloo Bridge-road, London, S.E.

The General Registrar.

Lieutenant-Colonel Norman C. King was reappointed general registrar.

The session then concluded.

THE CULTIVATION OF MEDICINAL PLANTS.

CONTRIBUTED BY A DRUG-GROWER.

THE communication from the National Health Insurance Commission for England to the Board of Agriculture quoted in the February number of the Board's *Journal* was useful in throwing the cold light of reasoned knowledge on a subject which has been largely dealt with by patriotic and enthusiastic amateurs. Even the leaflet 288 of the Board of Agriculture, on which much of the amateur herb-growing was based, seems to have been written and issued without very careful investigation of the subject. At all events, some of the important herb-growers in this country, who might be expected to know their own business and have actual knowledge of the practicability of the culture of most medicinal plants, were not asked by the Board for their opinion. On the other hand, before the Insurance Commissioners published their statement on the matter, they undertook very careful and thorough inquiries, the result of which is embodied in their communication to the Board of Agriculture.

Official and Non-official Plants.

In the first place, until the Insurance Commissioners' report appeared no attempt was made to differentiate between the drugs used in ordinary medical practice—i.e., the official B.P. drugs which are comparatively few in number, e.g., Belladonna, Hyoscyamus, Aconite, Taraxacum, Filix Mas, and Valerian—and the host of others which are used mainly by the so-called botanic druggists and herbalists, such as Agrimony, Mugwort, Wormwood, Betony, Figwort, and so forth. The Insurance Commissioners naturally devoted their attention to the official drugs, singling out from these four—viz., Belladonna, Hyoscyamus, Digitalis, and Colchicum—for serious consideration. All the other official medicinal plants which might conceivably be grown or collected in this country can be dismissed in a few words.

Aconite.—Its cultivation has probably never paid in England, and at the present time it is possible to secure an ample supply at prices not greatly in excess of the pre-war figure, large quantities having been imported from Spain.

Dandelion (*Taraxacum*) cannot possibly pay to cultivate, nor is it necessary to do so as it is so common a weed. The grubbing of the root is a toilsome and dirty occupation, unsuited for the usual amateur herb-collector. While the greater part of the supply of dandelion root is used for non-official purposes, there has been ample available for the preparation of the official extract and juice. Last autumn one firm alone received from the collectors 5 to 10 tons a week.

Couch grass (*Agropyrum*) is present in quantities in most arable fields, and large quantities are readily available if required. The amount used in medicine is trivial.

Male fern (*Filix mas*).—With this a curious difficulty has arisen. Manufacturers using English root have found themselves unable to produce an extract containing the proper proportion of filicin; the B.P. requires not less than 20 per cent. Possibly the English root does not contain as much of this principle as the continental owing to climatic conditions, or the root may have been gathered at the wrong season of the year. At a recent drug sale more than 20 bales of this root were offered but found no bidder.

Chamomile and Valerian.—Before the war the supplies came mainly from Belgium, and these will presumably be again available later. In the meantime, recourse has been taken to the Japanese product from a different species, stronger than the European variety, and to an Indian species which is also official.

There remain the four essential medicinal plants to which the Insurance Commissioners direct attention. Of these, there is no manner of doubt that the supply of wild *Digitalis* and *Colchicum* is sufficient. With the former the only difficulty is proper drying, but a little experience will be likely to ensure a good result. *Colchicum* is present abundantly in this country, but its harvesting presents one practical difficulty. It affects the best pastures, and as it must be dug in summer serious damage is done to the grass, farmers naturally requiring substantial compensation for their loss. This and the scarcity of labour make the present price very high.

Belladonna is, of course, far the most important of the four, and while great scarcity and famine prices have largely prevailed, large quantities are now under cultivation and ample supplies will probably be available this summer and certainly next, not only for the use of the medical profession at home, but also for export.

Hyoscyamus usually commands good prices, generally better than Belladonna, but it is a very uncertain crop and liable to attacks by insect pests which in some seasons completely destroy acres of plants in a few days. Occasionally it produces very heavy crops and is then decidedly profitable, but such years are rare, and between them will be many lean ones and some absolute failures. Its cultivation is therefore hardly suited to anyone of small means to whom a crop failure would be a serious matter.

The Difficulties of the Small Cultivator.

The prudent will bear in mind the experience with lavender 20 years ago. The great frost of 1895 destroyed a large proportion of the lavender plantations and misleading reports were published about a "dying English industry." The late Sir W. Gilbey interested himself in the matter, with the result that so much was produced within the next few years that the price dropped to a ruinously low figure, entailing much loss to the growers. In the cultivation of Belladonna, growers who are also manufacturers have an advantage over those who are growers only in being able to judge their own requirements and lay down a corresponding acreage of the plant. Certain British herb-growers have now five or six times as much land under medicinal crops as two years ago and expect to be entirely independent of outside supplies this summer. Large growers are in a position to employ up-to-date and extensive drying apparatus, and in this and other ways are at an advantage over the small grower, to whom, therefore, the caution of the Board of Agriculture may not be out of place. For the cultivator of an acre or two the provision of suitable drying plant, used only for a short period each year, is an expensive item. In a large business parts, if not all, of the drying plant can be used nearly all the year for one purpose or another. Unless, too, the small cultivator definitely secures a customer for his prospective crop at a fixed price before he sows it he runs a risk of not being able to sell at all. Unlike corn and potatoes, for which there is only too ready a market, the moment the demand for medicinal crops is met (and the demand is strictly limited) the crop becomes unsaleable.

The Collection of Wild Plants.

From a business point of view a safer outlet for the energies of the amateur drug-producer is in the collection of wild plants, remembering that, for the most part, these are used by herbalists. As soon as the supply is sufficient the collector ceases operations, and hence does not accumulate more than he can sell. The occupation, although healthy, is rather humdrum as well as toilsome. It should also be regarded as a war-time measure. Many of these drugs grow wild in parts of the world other than the Central Empires. France, Spain, Italy, Russia, India, and Japan produce much already, and will probably send more in the future. Such "crude" drugs are the raw material of the drug manufacturer, and, along with other raw materials, have not hitherto been considered a suitable object for a protective tariff.

A MONTHLY RECORD OF ATMOSPHERIC POLLUTION.

COMMITTEE FOR THE INVESTIGATION OF ATMOSPHERIC POLLUTION: SUMMARY OF REPORTS FOR THE MONTHS ENDING

Oct. 31st, 1916.

Place.	Rainfall in millimetres.	Metric tons of deposit per square kilometre. Insoluble matter. Tar.	Carbonaceous other than tar	Ash	Soluble matter. Loss on ignition	Ash.	Total solids.	Included in soluble matter. Sulphate as (SO_3).	Chlorine (Cl).	Ammonia (NH_3).
ENGLAND.										
Leicester	51	0·11	2·29	4·54	1·26	3·09	11·29	1·47	0·52	0·15
London—										
Meteorological Office...	64	0·08	1·60	2·42	1·28	5·12	10·30	1·52	0·90	0·03
Embankment Gardens	42	0·11	3·08	2·83	6·16	12·46	24·65	5·55	0·14	0·05
Finsbury Park ...	52	0·11	2·10	5·87	2·60	4·24	14·93	2·59	0·53	0·02
Ravenscourt Park	96	0·14	1·82	4·71	3 81	5·75	16·22	2·88	0·94	0 16
Southwark Park	39	0·08	1·90	3·90	1·86	3·08	10·84	1·71	0·53	0·07
Victoria Park ...	39	0·03	1 50	3·74	2·06	5·66	12·99	3 18	0·54	0 06
Wandsworth Com.	39	0·04	0·95	2·78	0·99	2·94	7·68	1·38	0 45	0 05
Golden Lane ...	71	0·04	2·73	4·00	2·26	5·08	14·11	2·57	1·05	0·31
Manchester—										
Queen's Park ...	112	—	—	—	—	—	19·0	—	—	—
School of Technology	104	—	—	—	—	—	23·6	—	—	—
Newcastle-on-Tyne	62	0·36	5·78	15·92	5·61	14·45	42·12	4·51	5 30	0·15
York	65	0·16	2·63	5·71	2·60	5·19	16·34	2·72	0·78	0·09
SCOTLAND.										
Coatbridge	131	0·28	1·92	3·88	2·19	6·97	15·24	2·41	0·88	0 17
Greenock	213	0·31	3·23	5·80	4·47	7 45	21·27	3 70	1·54	0·25

Nov. 30th, 1916.

Place.	Rainfall in millimetres.	Metric tons of deposit per square kilometre. Insoluble matter. Tar.	Carbonaceous other than tar	Ash	Soluble matter. Loss on ignition.	Ash	Total solids.	Included in soluble matter. Sulphate as (SO_3).	Chlorine (Cl).	Ammonia (NH_3).
ENGLAND.										
Leicester...	60	0·13	3·50	8·62	1·56	3·36	17·18	1·59	0·38	0·16
London—										
Meteorological Office...	98	0·07	1·40	2·47	3·95	4·73	12·62	2·21	1·40	0·02
Embankment Gardens	42	0·32	1·46	6 64	1·08	2·47	11·97	1·12	0·91	0·07
Finsbury Park ...	81	0·12	1·86	4·33	1·68	3·52	11·51	1·90	0·69	0·06
Ravenscourt Park	104	0·29	1·95	4·08	3·63	6·71	16·64	2·77	1·47	0·13
Southwark Park	73	0·08	1·82	3·42	1·71	4·64	11·66	2·03	0·98	0·08
*Victoria Park ...	—	—	—	—	—	—	—	—	—	—
*Wandsworth Com.	—	—	—	—	—	—	—	—	—	—
Golden Lane ...	96	0·07	2·31	3·48	3·06	3·83	12·75	2·20	1·19	0·17
Manchester—										
Queen's Park ...	76	—	—	—	—	—	14·60	—	—	—
School of Technology	57	—	—	—	—	—	19·70	—	—	—
Newcastle-on-Tyne	73	0·14	5·15	13·11	3·58	8·25	30 23	2·46	2·76	0·11
York	41	0·04	0·67	0·92	3·91	2 61	8·14	1·68	0 94	0·03
SCOTLAND.										
Coatbridge	86	0·13	1·97	3·84	2·03	5·23	13·70	2·24	0·5*	0·20
Greenock	149	0·29	2·43	3·73	2·39	6·63	15·46	2·73	1·11	0·21

* Owing to frost no returns were available at Victoria Park and Wandsworth Common. At Exeter and Malvern observations have been discontinued owing to the war.

"Tar" includes all matter insoluble in water but soluble in CS_2. "Carbonaceous" includes all combustible matter insoluble in water and in CS_2. "Insoluble ash" includes all earthy matter, fuel, ash, &c. One metric ton per sq. kilometre is equivalent to: (*a*) Approx. 9lb. per acre; (*b*) 2·56 English tons per sq. mile; (*c*) one gramme per sq. metre; (*d*) 1/1000 millimetre of rainfall.

The personnel of public health authorities concerned in the supervision of these examinations and of the analytical work involved remains the same as published in previous tables.

THE JOINT MEDICAL CONFERENCE IN CHINA.

(FROM OUR OWN CORRESPONDENT.)

THE Joint Medical Conference, which was held in Canton from Jan. 24th to 31st of this year, will long be remembered not only for its great success but also as the first real attempt made by Chinese and foreign medical men to join forces in this land. It may be remembered that the National Medical Association, consisting of modern-trained Chinese medical men, was formed in Shanghai just over two years ago. Last year THE LANCET published the proceedings of its first Conference held in Shanghai, where, among other things, it was decided to hold the Conference of 1917 in Canton in conjunction with the China Medical Missionary Association. The membership of the Missionary Association is about 450 and that of the National Association close on 500. There were 64 foreign and 92 Chinese doctors present, including 34 women.

The organisers in Canton did all they could to establish a record. Both Chinese and foreign doctors formed strong committees and enlisted the powerful support of the Civil Governor of the province, Chu Ching Lan. Good as his record had been as an enlightened and democratic official, no one expected that the Governor would go out of his way so much to promote the success of the Conference. His Excellency not only attended the opening reception on the evening of Jan. 24th, but he entertained all the delegates and their wives, numbering 170 persons, to a banquet on the roof garden of the leading Chinese hotel, opened the public health campaign in the city, and personally conducted the delegates in two yachts to the historic suburb of Whampoo on the Canton River for a picnic. No wonder the foreign guests expressed a hope that Governor Chu (who is only 42) would become one day President of China, as ensuring the rapid headway of medical science.

Papers Read.

The President of the Medical Missionary Association was Dr. W. H. Venable, of Kashing, while that of the National Association was Dr. Wu Lien-Teh (G. L. Tuck) of plague fame. Sessions were held in the morning and afternoon and on two occasions in the evening as well, Dr. Venable and Dr. Wu presiding on alternate days.

The most interesting papers read were as follows:—

1. *Standardisation in Mission Hospital Work*, by Dr. H. S. Houghton, who referred to the waste incurred in a medical man having to keep books, watch the market quotations, plan the building of hospitals, and generally look after affairs which could with greater economy be done by other men. He laid emphasis upon the need for proper staffing and management, keeping records and skilful nursing. He advocated standardisation in statistics and accounts. All financial records should embody clearly administration, maintenance, capital expense, and purchasing. There should be a central purchasing agency for all hospitals, situated preferably in Shanghai.

2. *Medical Schools in China*, by Dr. K. H. Hume (Johns Hopkins and Chargha), who classified them according to provinces, cities, date of foundation, and language taught. He enumerated 26 colleges altogether in the country, some missionary, some under the Chinese Government, some private, some joint foreign and Chinese, and two purely female institutions. The largest in point of numbers was the Army Medical College in Tientsin, with nearly 350 students, while the best equipped, with the possible exception of Hong-Kong which he had not visited, was the German Medical College at Shanghai, where students received a preliminary language training of three years and a professional training of four years. The total number of medical students in China at this moment was under 1500, of whom 136 were women—a very small number.

3. *The Nature of Plague Proteotoxins*, by Dr. Fred. Eberson, bacteriologist of the Manchurian Plague Prevention Service. These researches, undertaken to discover a serum for plague more potent than any, dealt with the peculiar nature of the proteotoxin of *Bacillus pestis*, which is unlike that of *B. typhosus*. Dr Eberson's conclusions are: (*a*. Powerful shock-producing poisons can be obtained by allowing normal guinea-pig or horse serum to act upon sensitised plague bacilli. (*b*) The proteotoxins of *B. pestis* are thermostabile, resisting prolonged heating at temperatures ranging from 50°–61° C. (*c*) A wide range exists within which the poisons may be obtained. The essential requirement is sufficient sensitisation of the plague organisms. (*d*) Proteotoxins are obtainable even after considerable exposures, the average being 14 hours, sometimes 18 hours. (*e*) The mechanism of plague infection seems to depend upon a primary sensitisation of the organisms, the antigen-sensitiser complex being important for poison production.

4. *Placenta Prævia* by Dr. R. M. Gibson (Hong-Kong). He enumerated the dangers of this serious complication in childbirth and produced statistics to show that it was more common among Chinese primiparæ than among Europeans, the proportion being 17 per cent. to 4·4 per cent. These cases were always serious for both mother and child and occurred in the seventh to eighth month of intra-uterine life. He advocated podalic version, and a brisk discussion ensued.

5. *Spinal Anæsthesia Produced by Tropacocaine.*—Dr. Cheng Ho (Canton) described the technique and enumerated a considerable number of major operations which he had done by this method. He recommended its general use where general anæsthesia was dangerous—e.g., in cases of heart or lung trouble.

6. *The Menace of Morphine*, by Dr. Wu Lien-Teh, who drew attention to the enormous increase in the output of morphine from British firms in Great Britain and its smuggling by Japanese agencies into China. In 1911 the declared export from Great Britain was 208,540 ounces, or 5½ tons; in 1914 this had increased to 504,020, or 14 tons. He urged everyone present to support a resolution to be sent to the Chinese and British Governments and other medical bodies to act without delay upon the articles of the Hague Opium Convention signed on Jan. 23rd, 1912.[1]

7. *Diabetes*, by Dr. H. G. Earle, of Hong-Kong University, who after outlining the various theories of its causation, invited discussion on its treatment. He himself considered absolute starvation the best. In this he was supported by other speakers.

8. *The Work of the China Medical Board of the Rockefeller Foundation*, by Mr. R. S. Greene, resident director of the Foundation in China. He outlined the work in various educational centres, including two large medical schools in Peking and Shanghai, and the considerable financial support accorded to the Union Medical College at Tsinanfu, Red Cross Hospital (Shanghai), Changsha and Canton, as well as the foundation of scholarships and fellowships to Chinese and foreign doctors, pharmacists, and nurses. The assistance rendered by the Rockefeller Foundation to medical education in China has been very considerable during its three years' activity in China.

Other Proceedings.

The Research Committee reported what had been accomplished during the last two years. This comprised work done on "Pelvic Measurement," "Height, Weight, and Chest Measurements," "The Circulation," and "Normal Blood." This attempt to find a normal or physiological standard among Chinese may become very valuable; already much good work in a similar direction has been conducted by a physiological chemist in Tsinanfu on "The Diet of Chinese." Such investigations as this and as those so excellently carried on by the Plague Prevention Service show how progressive the study of medicine is becoming in China.

Considerable interest was aroused by the presidential address delivered by Dr. Wu Lien-Teh on "Some Problems before the Medical Profession in China." He alluded to the prevailing ideas among the conservative Chinese regarding the medical profession, and said that the Japanese were trying more to adapt Western medical science to the needs of the people, and that it was necessary for their Western colleagues not to fall behind. He advocated the formation without delay of a Central Medical Council corresponding to the General Medical Council of Great Britain, with functions similar to those possessed by that body.

Two resolutions were passed in joint session of the Conference, the first drawing the attention of the Government to the need of adopting measures to prevent the morphine habit, and the second to the need of the establishment of a Central Medical Council in Peking, whose duties should be the fixation of a minimum standard of general education, the maintenance of a student and medical register, the drawing-up of laws and regulations affecting the medical profession, and the adoption of a medical nomenclature in Chinese.

The Conference terminated on Jan. 31st, after an election of officers for the next two years. The new President of the Medical Missionary Association is Mr. C. J. Davenport, F.R.C.S. Eng., surgeon to the Shantung-road Hospital, Shanghai, while Dr. Wu Lien-Teh was re-elected for a further term of two years as President of the National Association. The next place of meeting will be Peking, in 1919. There is no doubt that a joint conference is the ideal to be aimed at by those who wish to see medical science make rapid headway. Both sides can mutually help one another, and there is every evidence that the next two years will see even greater progress.

Canton, March 16th.

[1] We hope to publish a fuller note on this paper.

THE annual general meeting of the South London Hospital for Women, Clapham Common, will be held at 5, Carlton House Terrace, S.W., on Wednesday, June 6th, at 3.15 P.M. The Marchioness of Londonderry will preside, and among the speakers will be Dr. Lina Potter, who will give her experiences in Russia, and Dr. Jane Walker.

HOSPITAL DISPENSER FOR 49 YEARS.—The death occurred recently at Shoreham of Mr. E. Fenner, who for 49 years was dispenser at the Royal Sussex County Hospital at Brighton. On his retirement from the office the governors, as a mark of their appreciation of his work, elected him a life governor of the hospital. His only son, a captain in the veterinary service, succumbed to wounds while in captivity during the South African War.

IRELAND.

(FROM OUR OWN CORRESPONDENT.)

Welfare of Mothers and Children in Ireland.

A REPORT on the physical welfare of mothers and children in Ireland has been compiled for the Carnegie United Kingdom Trustees by Dr. E. Coey Bigger, the Medical Commissioner of the Local Government Board for Ireland, and was issued last week. It is an exhaustive and acute study of the causes underlying maternal and infantile disease and mortality, together with suggestions for improvement of present conditions. It gains added force from the strong feelings which have inspired the author. Dr. Bigger points out the special importance of the subject at present, when so many of the healthiest and fittest of our manhood, those who should be the fathers of the next generation, are losing their lives on the battle-fields of Europe. "The newly-born infant has less chance of living till this time next year than his father who is fighting out in France." It is true that the infant death-rate in Ireland—92 per 1000 births—is lower than that in England (110) or in Scotland (126), but whereas the rate in England has been steadily falling for many years past, in Ireland there has been little improvement. Dr. Bigger gives a table showing the geographical distribution of infant mortality, and from this it appears that in no less than eight counties the infant mortality is less than 60 per 1000. In only three counties—Antrim, Kildare, and Dublin—is the mortality over 100 per 1000. In each of the six county boroughs, however, the mortality is high, ranging from 108 in Limerick to 160 in Dublin. The greatest mortality is in the first few weeks of life, as, for example, in the Dublin registration area, where almost exactly one-third of the total deaths in the first year occur in the first month. From this fact it is clear that any scheme to diminish infant mortality must include consideration both of the health of expectant mothers and of the conditions under which childbirth takes place. Dr. Bigger gives reasons for believing that the most fatal of infantile diseases are bronchitis and pneumonia, the next group being diarrhœa and enteritis. Bronchitis and pneumonia would seem to be diseases that could be fairly readily prevented if mothers were better educated as to the means of preserving the health of their children.

The average puerperal death-rate for the past ten years has been a little over 2 per 1000 births. There is no Midwives Act in force in Ireland, and many of the confinements are attended only by "handy women." A marked proof of the value of skilled attendance at childbirth is shown by the fact that whereas the maternal death-rate in Dublin was 4·5 per 1000 in 1915, the rate among the patients attended by the Rotunda Hospital was only 2·3 per 1000. In giving this contrast its full value it is to be remembered that the Rotunda Hospital cases included many sent to the hospital on account of difficulties or complications.

Dr. Bigger has made a study of the economic conditions of working-class families, and he shows that before the war the wage of the agricultural labourer varied from 11*s.* to 15*s.* a week, while the average wage of the unskilled labourer in Dublin was 16*s.* 7½*d.* On such a wage it was impossible to support a wife and family in health. He adds:—

The tenement system of housing is largely responsible for the high mortality in the towns, because of the scanty water-supply, bad sanitation, and overcrowding of these tenement houses, which are mostly let in one- or two-room dwellings. That better housing can effect an enormous reduction in infant mortality is proved by the statistics of the Peabody Buildings in London. In these the density of the population was 504 persons per acre, but only 1·8 per room, and the infant mortality rate in them was 92 per 1000 when the rate for London was 120. It is therefore domestic not municipal overcrowding that is the important factor.

In parts of the North-East of Ireland it is the custom for girls to work as "half-timers" in the spinning-mills from the age of 12. These girls learn nothing of housecraft, and their health is bound to suffer from work at such a tender age. They often marry early. "Is it any wonder," says Dr. Bigger, "that a large proportion of the children of such mothers either die or are permanently disabled? ..... The manufacturers who employ 'half-timers' are contributing to the perpetuation of a great national wrong which cries aloud for redress."

I do not try to follow Dr. Bigger through the entire report, but I quote some of the more important of the recommendations with which he concludes:—

(1) A Midwives Act for Ireland; (2) schemes for the instruction of expectant and nursing mothers, and the establishment of infant and child-welfare centres; (3) the extension of the boarding-out system and the detention of mothers of illegitimate children for at least three months; (4) the extension of the Provision of Meals Act to rural districts, and a grant-in-aid from the Treasury for that purpose; (5) a scheme for the medical inspection of school children; (6) the raising of the age of girls allowed to work in factories to 15 years, and the establishment of a system of full-time medical officers of health; (7) improvement of housing conditions, the abolition of slums, and power to urban district councils to provide houses for the poorer working classes; (8) the establishment of milk depôts and more vigorous and uniform enforcement of the Dairies, Cowsheds, and Milkshops Order of 1908, with provision in large towns for bacteriological tests for the detection of tubercle bacilli in milk; (9) State-aid for parents of the poorer classes as a grant for each child.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

The Duration of War-deafness.

THE term war-deafness has been given to the deficiencies of hearing produced by the sudden change of pressure when a projectile of large calibre explodes. Three kinds of lesions have been distinguished affecting: (1) the middle ear alone (18 per cent.); (2) the middle and internal ear (57 per cent.); (3) the internal ear alone (25 per cent.). In the last case the injury leaves no visible effect. It has been said that 98 per cent. of these cases of deafness recover spontaneously; but Dr. Marage has recently brought before the Academy of Sciences evidence to show that this is not true, for lesions of the middle ear leave behind, after clinical recovery, more or less pronounced deafness which impairs the efficiency of officers, non-commissioned officers, and telephonists. In the 25 per cent. of cases of deafness due to disturbances of the internal ear without apparent lesions spontaneous recovery should be shown by an increase of auditory acuity proportional to the length of time since the injury was received. This was not the case. In 150 cases of deafness of 2–14 months' duration investigated by Dr. Marage the average of auditory acuity remained equally bad whatever the date of the lesion. Re-education is therefore an imperative need for these cases.

Intrascapular Fracture of the Hip Treated by Grafting.

M. Pierre Delbet reported recently to the Academy of Medicine on the results in fracture and pseudarthrosis of the neck of the femur treated by a method of his own. While extra-articular fractures when suitably treated consolidated by formation of bony callus leaving only slight weakness, intra-articular fractures through the surgical neck or with complete separation of the head resulted in pseudarthrosis with more or less complete disablement. This was the more regrettable since, contrary to accepted theory, intra-articular fracture was the rule among young people. Hitherto no satisfactory treatment has been devised. M. Delbet employs grafts of 6½ cm. to 11 cm. in length, according to the size of the neck of the femur, completely stripped of periosteum and becoming actually part of the living bone. Proof of this was furnished not only by successive radiographs made over a period of 2–3 years, but also by the fact that the separate portions of broken grafts became consolidated. The rapidity of the restoration of function after operation depended on the duration of the pseudarthrosis and the extent of the secondary muscular atrophy. The duration of the disablement was much reduced in patients thus treated at the outset, and M. Delbet estimates that in future it should not exceed that in ordinary fracture of the femur. The long duration of pseudarthrosis is a troublesome factor, inasmuch as it renders regeneration of bone difficult, if not impossible, and because the absorption of bone which has occurred by enlarging the space between the fragments necessitates a larger graft and exposes it to the risk of breaking. Delay does not, however, constitute an absolute contra-indication to operation. Nor is age in itself a drawback. Of the 15 cases treated by M. Delbet one must be excluded, that of a much debilitated woman of

66 years who became paralytic in the course of treatment. Of the remaining 14 cases, only one failed to derive benefit—namely, a woman of 59 years, excessively obese, suffering from multiple dry arthritis, who died within a year of operation without regaining her ability to walk. The 13 other patients are walking, three of them still improving. One of these, operated upon three months ago, already walks so well that reasonable doubt might arise as to the existence of a fracture. Another, operated upon four months ago, cannot yet dispense with a stick. The same is the case with a woman who has fractured her graft.

Trench Hemeralopia.

In a communication to the Academy of Medicine M. Aubaret noted that while disturbances of vision at night are fairly frequent at the front the number of cases of true hemeralopia is relatively small. The distinction of pseudo-hemeralopia from true hemeralopia is not difficult. True hemeralopia appears in several forms according to the site of insufficient adaptation—pupillary (a fairly frequent form), retinal, or cerebral. Cases of insufficient adaptation were found amenable to treatment with atropine. For faulty retinal or cerebral adaptation smoked glasses of a fairly high degree of obscurity, Nos. 4–5, worn during the daytime were found of service. In all doubtful cases of hemeralopia care should be taken to improve the general condition; physical and mental rest, the exhibition of tonics and reconstituents, and a routine of diet conducive to the elimination of toxins are the measures indicated.

Obituary.

MAJOR GREENWOOD, SEN., M.D. BRUX., L.R.C.P. LOND., M.R.C.S. ENG., D.P.H., LL.B. LOND.

Major Greenwood, the deputy coroner for North-East London, who died on May 16th, aged 63, in Hackney, where he had long resided, came of a family which had long been established in the East-End of London. He was the son of the late Dr. Major Greenwood of Dalston, and was educated at the Merchant Taylors' School, whence, in 1873, he obtained a Buxton scholarship at the London Hospital. He qualified in 1876, taking the M.R.C.S. Eng., and the L.R.C.P. Lond. in the following year, and held various resident appointments at the hospital. Later he became resident medical officer to the North-Eastern Hospital for Children, now the Queen's Hospital for Children, and on leaving this appointment he settled down to general practice first in Dalston and later in Hackney. But at the same time he displayed his energetic temperament by joining Lincoln's Inn and reading for the Bar. In 1887 he took the M.D. of Brussels and in the same year the D.P.H. of the Conjoint Board, and in 1894, having been called to the Bar, he took the LL.B. Lond.

The mere enumeration of Dr. Greenwood's appointments will show how active he was professionally, politically, and socially. He was, in addition to being a busy medical man and a deputy coroner, senior district surgeon to the City of London Lying-in Hospital, public vaccinator for Haggerston and medical officer for No. 5 District of St. Leonard, Shoreditch, medical officer to King Edward's Industrial School, treasurer of the Brussels Medical Graduates' Association, secretary of the Poor-law Medical Officers' Association, Vice-President of the Medical Defence Union, and a member of the Central Council and President of the Metropolitan Counties Branch of the British Medical Association. In the activities of the British Medical Association he played a valuable part in many capacities.

Major Greenwood was a voluminous writer along lines of widely differing directions. He was the editor of *Poor Law Supplement*, the author of monographs on zoology and vaccination, and of essays on the Great Plague of London and other subjects of historical and literary interest. He obtained a prize in 1894 for an essay in the *Law Students' Journal* upon the Responsibility of Judges, and in the same year he published a note summarising the claims of the two professions, law and medicine, on the coronership. He wrote also an exposition of the Law Relating to Poor-law Medical Service, and a story of medical life, entitled "John Armstrong." It will be gathered that Major Greenwood was an exceedingly busy man, and all the numerous public and private claims upon his time received from him just acknowledgment. His wide experience, courage, and industry earned for him the regard of the large section of the medical profession to whom he was known personally or through his works, and where controversy ran high in medical politics he allowed no personal feelings either to mar his relations with opponents or to diminish his zeal in the cause of medical reform.

Dr. Major Greenwood leaves by his first wife a son, Captain M. Greenwood, R.A.M.C., of the Lister Institute of Preventive Medicine. In 1906 he remarried, and his widow survives him. To her and to Captain Greenwood we address our sympathies.

THE SERVICES.

ROYAL ARMY MEDICAL CORPS.

Capt. (temp. Major) J. Owen relinquishes his temporary rank.

Major William C. Croly to be acting Lieutenant-Colonel whilst in command of a Field Ambulance.

Capt. C. Woollard, C.A.M.C., to be temporary Major.

Temp.-Lieut. W. F. Gibb to be temporary Captain.

Temporary Honorary Lieutenants to be temporary Honorary Captains while serving with the Welsh Hospital, Netley: E. V. Jones and J. Boyd.

Officers relinquishing their commissions:—Temporary Captains: A. D. Forbes, R. V. Dolbey, J. I. M. Jamieson, and L. J. J. Nye, and J. H. P. B. Barrett, on account of ill-health. Lieutenants: E. C. Smith, F. H. Hurlburt, G. T. Griffith, A. J. Shilstra.

Lieutenants to be Captains: D. Loughlin, L. J. F. Bull, M. St. C. Hamilton, H. M. Wharry, J. P. Bracken, P. R. E. Kirby, E. H. V. Hensley, C. E. Bond, R. C. Davenport, R. H. Yolland.

To be Lieutenants: A. Rose-Innes, J. P. Williams, E. V. Beale, C. K. Mowll, D. Cameron, H. N. Pritchett, R. S. Corbett, H. W. H. Holmes, from University of London Contingent, O.T.C.; W. J. Walters; J. M. Norman, from Edinburgh University Contingent, O.T.C.; A. L. Packham; G. R. Hubbard; C. G. S. Milne from Aberdeen University Contingent, O.T.C.; S. Vidot; T. P. Chapman from Dublin University Contingent, O.T.C.; E. D. Roberts; W. J. Walters.

Second Lieut. A. Robertson, from Unattached List, T.F., to be Lieutenant.

Captains relinquishing their commissions: A. W. B. Loudon, A. Ramsbotham, W. F. Munro, W. H. P. Hey, K. W. Jones, D.S.O.

TERRITORIAL FORCE.

Lieut.-Col. (temp. Col.) W. K. Clayton relinquishes his temporary rank on vacating the appointment of Assistant Director of Medical Services, and is restored to the establishment.

Lieut.-Col. (temp. Col.) R. Pickard, C.M.G., relinquishes his temporary rank on vacating the appointment of Assistant Director of Medical Services, and is restored to the establishment.

Capt. (acting Lieut.-Col.) J. W. Mackenzie relinquishes his acting rank on alteration in posting due to reorganisation.

Major (acting Lieut.-Col.) F. B. Treves relinquishes his acting rank on alteration in posting due to reorganisation.

Capt. (acting Lieut.-Col.) R. Waterhouse to relinquish his acting rank on alteration in posting due to reorganisation.

Capt. (temp. Major) L. M. V. Mitchell relinquishes his temporary rank on alteration in posting due to reorganisation.

Capt. (acting Lieut.-Col.) H. N. Barnett relinquishes his acting rank on ceasing to command a Field Ambulance.

Capt. R. A. Broderick to be acting Lieutenant-Colonel whilst commanding a Field Ambulance.

Capt. (temp. Lieut.-Col.) E. Alderson reverts to the temporary rank of Major on ceasing to command a Field Ambulance.

Major (temp. Lieut.-Col.) W. M. Sturrock relinquishes his temporary rank on alteration in posting.

Majors to be temporary Lieutenant-Colonels: H. B. Roderick, A. Cooke, F. W. Burton-Fanning.

Captains to be temporary Majors: W. Tyson, H. A. Cookson, M. G. Foster, J. H. Thursfield, H. W. Wilson, F. D. S. Jackson, W. S. Colman, E. R. Carling, G. A. Ewart, J. Everidge, D. H. de Souza, A. J. Jex-Blake.

Major F. J. Steward to be temporary Lieutenant-Colonel.

Lieut.-Col. Sir J. K. Fowler, K.C.V.O., is restored to the establishment.

Major G. N. Biggs to be temporary Lieutenant-Colonel.

Major J. G. Martin to be acting Lieutenant-Colonel whilst commanding a Casualty Clearing Station.

Capt. P. G. Williamson to be Major.

Capt. C. Mearns to be Captain.

Captains restored to the establishment: A. Ramsbottom, W. F. Munro, A. W. B. Loudon, K. W. Jones.

Capt. R. E. Bickerton, D.S.O., to be acting Lieutenant-Colonel whilst commanding a Field Ambulance.

Major (temp. Lt.-Col.) J. C. S. Burkitt relinquishes his temporary rank on alteration in posting.

Major (temp. Lt.-Col.) W. S. Kerr relinquishes his temporary rank on ceasing to command a Field Ambulance.

Capt. (acting Lt.-Col.) F. D. Blandy relinquishes his acting rank on ceasing to command a Field Ambulance.

Capt. (temp. Maj.) W. Blackwood to be acting Lieutenant-Colonel whilst commanding a Field Ambulance.

Capt. W. H. P. Hey is seconded for service overseas.

To be Lieutenant: J. Waterston.

Lieutenants to be Captains: W. J. Wilson, D. Lyon, R. E. Pitts.

Lieut.-Col. A. A. Watson relinquishes his commission.

Capt. F. Smith relinquishes his commission on account of ill-health.

Capt. S. Hughes relinquishes his commission on account of ill-health, and is granted the honorary rank of Captain.

Capt. H. G. Smeeth relinquishes his commission.

Correspondence.

"Audi alteram partem."

THE LATE SIR VICTOR HORSLEY.

To the Editor of THE LANCET.

SIR,—Last July came the news of Sir Victor Horsley's death in Mesopotamia. We ought to have some record of his life and of his work; we cannot afford to forget him and what he did for medicine and surgery. I am collecting notes for a book; I hope that it will plainly show what we lost when we lost him. I ask for help in this venture from his friends and colleagues, and from the many patients in hospital practice or in private practice who have reason to be thankful for his skill and his kindness. I want all that they can tell me of him, and any letters of his which they will let me use. Without their help nothing that I can write of him will be of much service to anybody. Great care will be taken to return all letters.—I am, Sir, yours faithfully,

21, Ladbroke-square, W.11, May 24th, 1917. STEPHEN PAGET.

THE LUMLEIAN LECTURES AND MEDICAL RESEARCH.

To the Editor of THE LANCET.

SIR,—It has necessarily been a terrible shock to me to receive such a snub from Sir James Mackenzie in your last issue. When Olympian Zeus frowns the world must needs tremble. And what of the unfortunate individual? I, however, console myself to this extent, that the majority of those who are interested in the progress of heart disease are aware that from 1900–13 no year has gone by in which my collaborators and I have not endeavoured to throw some new light on the problems of rheumatism and heart disease. In passing, I would correct his statement that the microbe was "my discovery." First described in 1899 by Wassermann, it was worked out in the various lesions and demonstrated by Dr. Paine and myself in 1900. This work took two years and was overlapped by Wassermann, who got home first on rheumatic arthritis.

That the discovery has been therapeutically and clinically sterile is in its turn a discovery—Sir James Mackenzie's discovery. It is hardly, I think, yet corroborated by the numerous clinical assistants who have kindly worked with me, or by the hundreds of rheumatic children and many adults I have supervised in the last 18 years. Such corroboration, however, necessarily takes time. I regard it as a kindly act on his part to indicate how I should have worked and be working at the subject instead of bawling "my discovery." Yet I am embarrassed to this extent that already (1900–1905) I had shown with Dr. Paine that an important site of entrance of the infection, long suspected, was the tonsillar region, and that already in my writings on heart disease and rheumatism in children I have described the earliest stages and their clinical importance. I should have done more I admit, but the routine of a general physician is arduous. For at least ten years steady preventive work has been done on the throat and nose both at University College Hospital and the Hospital for Sick Children, and I should have hoped, nay even expected, that it would have reached Sir James Mackenzie by A.D. 1917.

I would assure him I am not at all at a loss as to what to do with "my discovery." I am aiming at the prevention of rheumatic heart disease in childhood, and need the assistance of our profession. This is a long affair, not so rapid, for example, as a polygraph tracing. I am aiming at the arrest of the advance of heart disease in childhood by, among other steps, the institution of special rest-homes. I am trying to take my part in persuading our profession that salicylate of soda is not a specific remedy. Lastly, I am trying to introduce a modern study of heart disease based upon the development of infective heart disease in childhood. The study of heart disease in general terms is at present upside down, and I want to put it the other way up. When I have succeeded, which will not be at once, heart affections will be placed in their correct perspective in human ailments—a decided advance, I think, if we may judge by many of the recent writings. The peculiarities of adult cardiac disease will then also be recognised in the process of evolution. I have other aims, but those enumerated will probably suffice to occupy the rest of my life-time.

I am, Sir, yours faithfully,

Devonshire-place, W., May 26th, 1917. F. JOHN POYNTON.

TUBERCULOSIS AND THE WAR.

To the Editor of THE LANCET.

SIR,—At one time I was probably as enthusiastic for sanatorium treatment as Dr. E. E. Prest[1]; in fact, when in Parliament, and later, I had a good deal to do with the agitation which resulted in the erecting of a sanatorium of 370 beds in Western Australia. When in charge of the Coolgardie Sanatorium, however, I found that some patients treated in their own homes did better than any similar cases treated in the sanatorium. When I came to England to study the problem of the relation of dispensary to sanatorium treatment for tuberculosis, I was fortunate in being appointed to my present position for the duration of the war, which has a large dispensary as well as a small sanatorium of 27 beds. This has given me the opportunity I sought. The conclusion to which I have come after two years of study of that phase of the question is that, although for a certain number of tuberculous patients sanatorium treatment is not only beneficial but essential, in the majority of the really early cases a sanatorium is not only not necessary but inadvisable.

Dr. Prest and I would probably differ in our definition of an "early case." I would probably consider his "early case" further advanced as we both appear to differ as to the meaning of "cured." What he would consider cured I would consider as arrested. To me an early case is one which used to be considered as incipient phthisis—that in which the individual's resistance to the tuberculous invasion is threatened. In the same way the so-called cured cases are, to me, cases in which resistance has been re-established. The fact, however, remains that in a large number of cases the resistance can be re-established without sanatorium treatment, and this especially holds of the working class, where it will be frequently discovered that the cause of loss of resistance is working overtime or undue strain of some kind which can be relieved, though in a number of these cases it cannot be done except in a sanatorium. It is the insistence on the need for sanatorium treatment in all cases that does so much mischief and makes many people hesitate, when they suspect tuberculosis, to have their suspicion verified.

This year and last we had 104 cases working, earning full wages and attending the dispensary, and of these only four have died from any cause, and only three have had to be taken from work and are going downhill. I have about 60 cases a month sent to me for diagnosis, of whom about half show definite evidence of what may be considered active tuberculosis, and there are some 800 cases under observation. Our funds and opportunities allow about ten beds in the sanatorium each month. With proper supervision this is sufficient for the treatment of all cases in Class 1.

The great problem that at present needs serious consideration and discussion is not "how to send all cases to a sanatorium," but "When is sanatorium treatment necessary and beneficial, and how many beds are necessary for those cases who can by that means have their resistance raised?" This is essentially a question for the dispensary to solve, where all classes of cases are seen during their whole time, not one or two classes for part of their time.

The present interest in the matter gives hope for a future settlement of this question of national importance, and its foundation must rest on the information acquired in a tuberculosis dispensary and the administration of the National Insurance Act. I am, Sir, yours faithfully,

HENRY A. ELLIS.

Tuberculosis Dispensary, Middlesbrough, May 21st, 1917.

THE TECHNIQUE OF LUMBAR PUNCTURE.

To the Editor of THE LANCET.

SIR,—In reference to the correspondence on the subject of what Dr. T. J. Horder aptly terms a restricted flow from a tense theca I should like to add a few observations from my personal experience gained from 1100 punctures performed on cases of real or suspected meningitis.

[1] See THE LANCET, May 5th, 1917, p. 700.

In the first place a restricted flow may occur drop by drop, simulating the normal rate, or, on the other hand, five or six drops may run in rapid succession, followed by a pause. This latter phenomenon would at once suggest that the mouth of the cannula was not lying free in the arachnoid space. Another point is that when such a restricted flow occurs the respiratory movements are not imparted to the column of fluid. The explanation of this occurrence must of necessity be largely a matter of conjecture. A possible explanation is furnished by the surmise that the dura mater is pushed in front of the needle and then pierced, the mouth of the cannula thus lying in a narrow chink between the approximated dorsal and ventral dura mater. The dura mater is bound to the bony canal by loose areolar tissue which could be easily separated by a comparatively blunt needle. In this regard I may remark that this contretemps occurs most frequently when the needle fails to reach the theca at the first plunge and has already struck bone. Further, I have more often met with this difficulty at the end of a series of eight or ten operations on different patients when the same needles had to be reboiled and used a second time. The simple manœuvre of gently withdrawing the needle will frequently establish a good flow, possibly by widening the interval between the surfaces of dura mater. Rotation of the needle will in some instances establish a full flow, particularly if the needle has been introduced in such a way that the mouth of the cannula does not look directly towards the cephalic aspect of the arachnoid space. If these manœuvres fail a full flow will always be obtained by taking a sharp needle and selecting another space. A "dry puncture," except in cases of hydrocephalus, I take to be proof-positive that the needle has not entered the theca. Where the fluid is thick and purulent and a good flow cannot be obtained even with the assiduous use of the stylet it seems probable that, as Dr. Horder suggests, the needle may have entered a loculus. A fresh puncture at another level will often secure a more abundant flow. When the fluid is blood-tinged and not obviously purulent it is better to perform a fresh puncture in order to obtain fluid free from blood for cytological examination. I have rarely found fluid blood-stained on a second puncture at another level.

I am, Sir, yours faithfully,

MICHAEL FOSTER,

British Expeditionary Force, May 22nd, 1917. Captain, R.A.M.C. (T.).

TRENCH SHIN.

To the Editor of THE LANCET.

SIR,—While greatly interested in Lieutenant-Colonel Graham Chambers's paper on "Trench Shin" in your issue of May 19th, experience does not lead one to agree with all he has to say regarding etiology and treatment. Opportunities for observing this complaint have been incessant during two and a half years' work with a battalion on the Western front, though there has been no chance of following up the more severe cases. If the disease is micro-organic in origin and possibly infective, which seems probable, constriction and exposure must play a very minor part. Last winter this battalion suffered more from exposure and deep mud than even in 1914, yet more cases are occurring now when the weather is good and the recent fighting has been more or less in open and clean country. Experiences in 1915 and 1916 bear this out. If the puttee played an important part as a causative factor, one would expect far more cases in the infantry, and the incidence of the disease (like the wearing of the puttee) to be continuous. The name "infectious fibrositis" precludes constriction and exposure. Those who previously held that trench foot was due to the tight puttee, and others who now hold it to be an infection with *Scopulariopsis konngii* from contact with mud, will both doubtless find analogical comfort in this paper on "Trench Shin."

With regard to experimental treatment, in slight cases, one's energies are naturally limited by the medical pannier. The pain is most intractable; to relieve it and so give sleep, aspirin, phenacetin, and sodium salicylate quite fail in small or large doses; opium has disadvantages; in fact, morphia injections alone are reliable, and they of course cannot be repeated indefinitely. The pain is greatly increased by constriction and bandaging; lessened by gentle massage and the use of liniments. Complete rest, unless the pyrexia is marked, does not seem so desirable as "light duty," because the pain is at its worst when resting. Elevation of the legs is indicated. The disease seems self-limiting, and tonics and rest usually restore the health in from 10 to 30 days. After careful inquiry and observation, the much suspected and often guilty louse has been let off with a caution as being the cause of "trench shin"; for the worst cases have often occurred among the cleanest N.C.O.'s and men. On the other hand, officers in this battalion—usually free from lice—have never been sufferers.

I hope Lieutenant-Colonel Graham Chambers will take this not so much in the light of a criticism of his paper as a statement of the experiences of the writer.

I am, Sir, yours faithfully,

IVAN C. MACLEAN,

B.E.F., France, May 26th, 1917. Temporary Captain, R.A.M.C.

THE PARAFFIN TREATMENT OF BURNS.

To the Editor of THE LANCET.

SIR,—As chief surgeon of a Russian flying surgical column for two years, and of one of the largest Russian field hospitals for the past seven months, I have had the handling of a good many cases of burns, frost-bites, and scalds, and was at my wits' end, so to speak, for a treatment that would relieve pain, promote healing, and at the same time act as a disinfectant. About a year ago I heard about the paraffin treatment used in France. Unfortunately, it was practically impossible to obtain any of this remedy. I have, however, been using for nearly a year the following formula:—

Resin, 1 part; beeswax, 1 part; paraffin, 4 parts. Melt in a dish set in boiling water for half an hour. I put it on the same way as the French remedy is used. With a metal spray, spray on a thin coat, then cover with a very thin layer of cotton. Then with a camel's-hair brush put on three or four layers of the wax. After it has hardened for 10 minutes bandage.

Frozen toes, fingers, and ears respond splendidly. In scalds (we have many on account of the Russian steam baths) the pain is entirely stopped at once, and the skin heals readily. Burns from the German liquid fire are often very deep, the pain and suffering is intense, yet after applying the wax the patients soon go to sleep. Care must be taken not to let any water get into the wax. Only a small patch should be sprayed at a time, and covered with a thin layer of cotton while the wax is still hot. Another area should then be sprayed until the whole wounded surface is covered. Finally, with long strokes of the brush, redipping with each stroke, the whole area is gone over again. A new covering is put on each day until there is no further sign of pus, then every two or three days. I am, Sir, yours faithfully,

EUGENE HURD,

Russian Front, April 9th, 1917. Surgeon-Colonel.

THE INSTITUTE OF MASSAGE AND REMEDIAL GYMNASTICS.

To the Editor of THE LANCET.

SIR,—In the April number of the *Journal of the Incorporated Society of Trained Masseuses* an account was given of the formation of the Institute of Massage and Remedial Gymnastics and a more or less accurate description of the negotiations which took place up to the conference between delegates of the advisory board and of the council of the Incorporated Society of Trained Masseuses on the one side and of the Institute of Massage and Remedial Gymnastics on the other side. The article ends with the following paragraph:—

> The representatives of the newly formed Manchester Institute who attended the conference mainly directed their remarks to criticising the methods and constitution of the Incorporated Society of Trained Masseuses, and the conference broke up without any tangible result being attained.

In the notes of the conference made by the advisory board of the Incorporated Society of Trained Masseuses the following paragraph occurs:—

> It was decided that no shorthand writer should be present at the conference, and that the proceedings should be regarded as confidential, though no objection was taken to either party communicating the general tenor of the discussion to their respective councils.

The article referred to is, therefore, a breach of the agreement which was entered into at the conference. As negotiations are still proceeding as a result of the conference, it is too early to say whether they will be successful or otherwise, but this article is so prejudicial to the interest of the profession of massage for which we are working, that we feel it is essential to express our disapprobation of the course adopted without further delay.

We are, Sir, yours faithfully,

W. MILLIGAN, M.D., Chairman of the Executive Council

A. E. BARCLAY, M.D., Honorary Secretary.

71, King-street, Manchester, May 26th, 1917.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue :—

Killed.

Capt. W. G. Cummings, R.A.M.C., received his education at Queen's University, Belfast, and qualified in 1903. He was in practice at Hanwell, London, at the outbreak of war and joined the R.A.M.C. forthwith. He was a first-class Rugby player in his student days.

Lieut.-Col. W. B. Grandage, Royal Field Artillery, was engaged in the war as a combatant officer. He was educated at Cambridge and at St. Bartholomew's Hospital, qualifying in 1905, and held appointments at the Victoria Hospital for Children, at the Queen Charlotte Lying-in Hospital, and at St. Bartholomew's. He was a well-known Rugby football player and was engaged in practice in South Kensington prior to the war.

Drowned.

Capt. H. H. Robinson, D.S.O., R.A.M.C., was educated at Owens College, Manchester, and qualified in 1899. Before joining the R.A.M.C. he was in practice at Birkenhead, where he was honorary medical officer to the Children's Hospital. He was awarded the D.S.O. in August last year (see THE LANCET, Sept. 2nd, 1916, p. 450).

Died.

Captain R. F. Russell, R.A.M.C., qualified in 1905 at Aberdeen and practised at Methlick, Aberdeenshire, where he was medical officer and public vaccinator, and later joined the Jamaica Medical Service.

Missing, believed Drowned.

Capt. C. A. W. Pope, R.A.M.C., was educated at Cambridge and at St. Bartholomew's Hospital, London, and qualified in 1903. He had held appointments at the Somerset Hospital, Capetown, and at the South Devon and East Cornwall Hospital, and had been medical officer in charge of military families at Aldershot. He was in practice at St. Leonard's-on-Sea prior to joining the R.A.M.C.

Lieut. J. G. B. Smith, R.A.M.C., was a student at St. Bartholomew's Hospital and qualified in 1915.

Capt. A. Tilbury, R.A.M.C., was a student at Guy's Hospital and qualified in 1913. He was in practice in South London when war broke out and was given a commission in the R.A.M.C. He saw service in Egypt and returned to England later. He went down in the torpedoed s.s. *Transylvania*.

Previously reported Missing, now reported Killed.

Surgeon A. M. Russell, R.N., qualified at Glasgow in 1914, and joined the Navy soon afterwards.

Previously reported Wounded, now reported Died of Wounds.

Capt. R. H. Wilson, R.A.M.C., attached R.F.A., qualified at Belfast in 1915, and joined up soon afterwards.

Wounded.

Lieut. A. S. Carter, R.A.M.C., attached Worcester Regt.
Capt. J. C. Fergusson, R.A.M.C.
Lieut. J. W. Mackie, R.A.M.C., attached Northumberland Fusiliers.
Capt. H. N. Stafford, R.A.M.C.
Capt. J. F. Bourke, M.C., R.A.M.C., attached Scottish Rifles.
Capt. T. J. Gilmore, R.A.M.C., attached Gloucester Regt.
Capt. J. A. Gilfillan, R.A.M.C., attached Seaforths.
Lieut.-Col. J. J. Fraser, Canadian A.M.C.
Capt. W. W. J. Lawson, R.A.M.C.

DEATHS AMONG THE SONS OF MEDICAL MEN.

The following sons of medical men must be added to our lists of those who have fallen during the war:—

Acting Capt. C. C. Codner, Somerset Light Infantry, younger son of Dr. J. Codner, of Corfe, near Taunton.
Lieut. B. O. Warner, Essex Regiment, youngest son of the late Dr. P. Warner, of Woodford Green, Essex.
Second Lieut. J. M. Dunwoody, Royal Dublin Fusiliers, only son of Dr. W. G. Dunwoody, of Ramsgate.

[The name of Capt. C. A. R. Gatley, R.A.M.C., should not have been included under this heading in our last issue, and we much regret the error. Capt. Gatley is wounded, and is at present in the Hall Walker Hospital for Officers at Regent's Park, London.]

THE HONOURS LIST.

The following awards to medical officers are announced :—

Bar to the Military Cross.

Temp. Capt. Reginald Peter Nutcombe Buckland Bluett, M.C., R.A.M.C., attached Highland Light Infantry.

For conspicuous gallantry and devotion to duty. He displayed great judgment and endurance in organising the stretcher-bearers in the attack. He worked continuously throughout the day, exposed for many hours to very heavy hostile fire.

(The award of the Military Cross was announced in THE LANCET of April 8th, 1916, p. 798.)

Military Cross.

Temp. Capt. Thomas Dowzer, R.A.M.C., attached Manchester Regiment.

For conspicuous gallantry and devotion to duty. He showed great personal bravery in moving about in the open under heavy fire, organising his bearers, and assisting in the search for the wounded.

Capt. Thomas Graham, R.A.M.C.

For conspicuous gallantry and devotion to duty. He rendered invaluable assistance in evacuating the wounded under very heavy fire. He has at all times set a splendid example of courage and determination.

Capt. Thomas Whittle Martin, R.A.M.C., Spec. Res., attached Royal Scots.

For conspicuous gallantry and devotion to duty. He was of the greatest assistance in organising the evacuation of the wounded across "No Man's Land" during the operation. He has on many previous occasions done fine work.

Temp. Capt. Francis Lorne McKinnon, R.A.M.C.

For conspicuous gallantry and devotion to duty. He personally led a search party up to the enemy wire in front of the village, under very close rifle and machine-gun fire. He succeeded in recovering two wounded men.

Temp. Capt. Charles O'Brien, R.A.M.C.

For conspicuous gallantry and devotion to duty. Although wounded, he insisted on remaining in command of the bearer division of his field ambulance, and in so doing materially expedited the removal of the wounded from the field.

Capt. Bertrand Cecil Owens Sheridan, R.A.M.C., Spec. Res., attached Worcester Regiment.

For conspicuous gallantry and devotion to duty. He tended the wounded continuously for 12 hours under very heavy fire. He set a splendid example of courage and determination throughout.

Capt. George Charles Willcocks, Australian A.M.C.

For conspicuous gallantry and devotion to duty. He worked continuously for about 16 hours in the open under heavy fire and successfully evacuated a large number of wounded men. He set a splendid example of courage and determination.

MENTIONED IN DESPATCHES.

In a despatch dated April 9th, 1917, received from Field-Marshal Sir Douglas Haig, G.C.B., Commander-in-Chief of the British Armies in France, the names of the following medical officers are mentioned :—

Royal Navy.—Temp. Surg. H. B. Padwick, D.S.O.
Royal Marines.—Temp. Surg. J. N. M. Ross, R.N.

Army Medical Service.

Headquarters Staff.

Lt.-Col. (temp. Col.) J. D. Alexander, R.A.M.C.
Capt. D. C. G. Ballingall, M.C., R.A.M.C.; Lt.-Col. (temp. Col.) H. P. W. Barrow, C.M.G., R.A.M.C.; Capt. J. J. H. Beckton, R.A.M.C.; Lt.-Col. (temp. Col.) W. C. Beevor, C.B., C.M.G., ret. pay; Lt.-Col. W. W. O. Beveridge, C.B., D.S.O.; Col. A. W. Bewley; Lt.-Col. (temp. Col.) R. J. Blackham, C.I.E., D.S.O., R.A.M.C.; Lt.-Col. W. R. Blackwell; Lt.-Col. (temp. Col.) R. W. Bliss, D.S.O., R.A.M.C.; Lt.-Col. (temp. Col.) A. W. N. Bowen, R.A.M.C.; Lt.-Col. (temp. Col.) G. W. Brazier-Creagh, C.M.G., ret. pay; Col. E. G. Browne, C.B.; Col. C. H. Burtchaell, C.M.G.
Col. H. Carr, C.B.; Capt. F. Casement, R.A.M.C.; Maj. H. St. M. Carter, D.S.O.; Lt.-Col. S. L. Cummins, C.M.G.
Capt. K. K. Drury, M.C.
Lt.-Col. and Bt.-Col. H. Ensor, D.S.O., R.A.M.C.
Lt.-Col. H. B. Fawcus, C.M.G.; Temp. Col. C. C. Fleming, D.S.O., ret. pay (Res. of Off.).
Col. J. J. Gerrard; Capt. A. J. Gibson; Lt.-Col. (actg. Col.) J. G. Gill, R.A.M.C.; Lt.-Col. (temp. Col.) J. Grech, D.S.O., R.A.M.C.; Lt.-Col. (temp. Col.) F. J. Greig, ret. pay (Res. of Off.).
Maj. J. A. Hartigan, D.S.O.; Lt.-Col. (actg. Col.) H. Herrick, R.A.M.C.; Temp. Capt. G. J. D. Hindley, R.A.M.C.; Lt.-Col. (temp. Col.) H. A. Hinge, C.M.G., R.A.M.C.; Lt.-Col. (temp. Col.) A. W. Hooper, C.M.G., D.S.O., R.A.M.C.
Col. (temp. Surg.-Gen.) J. M. Irwin.
Col. R. Jackson.
Col. R. Kirkpatrick, C.M.G.
Col. Sir W. B. Leishman, Kt., C.B., F.R.S.; Lt.-Col. L. N. Lloyd, C.M.G., D.S.O.; Maj. N. Low, D.S.O.
Capt. F. A. McCammon, M.C., R.A.M.C.; Surg.-Gen. W. G. Macpherson, C.B., C.M.G., K.H.P.; Temp. Capt. E. S. Marshall, R.A.M.C.; Maj. A. H. MacN. Mitchell; Lt.-Col. C. K. Morgan, C.M.G.
Col. D. M. O'Callaghan; Lt.-Col. (temp. Col.) S. de C. O'Grady
Surg.-Gen. M. W. O'Keefe, C.B.
Capt. H. F. Panton, M.C.; Capt. G. S. Parkinson; Lt. (temp. Capt.) J. H. Pendered, R.A.M.C.; Col. (temp. Surg.-Gen.) W. W. Pike, C.M.G., D.S.O.; Lt.-Col. (temp. Col.) J. Poe, D.S.O., R.A.M.C.; Lt.-Col. (temp. Col.) C. E. Pollock, D.S.O., R.A.M.C.; Surg.-Gen. R. Porter, C.B.

Lt.-Col. (temp. Col.) M. McG. Rattray, R.A.M.C.; Maj. J. D. Richmond; Maj. M. B. H. Ritchie, D.S.O.; Col. J. J. Russell, C.B.

Surg.-Gen. R. H. S. Sawyer, C.M.G.; Lt.-Col. (temp. Col.) D. D. Shanahan, D.S.O., R.A.M.C.; Maj. G. F. Sheehan, R.A.M.C.; Col. (temp. Surg.-Gen.) B. M. Skinner, C.M.G., M.V.O.; Surg.-Gen. Sir A. T. Sloggett, K.C.B., C.M.G., K.H.S.; Maj. S. B. Smith; Lt.-Col. (temp. Col.) F. A. Symons, C.M.G., D.S.O., R.A.M.C.

Capt. G. P. Taylor, M.C.; Lt.-Col. (temp. Col.) H. S. Thurston, C.M.G., R.A.M.C.; Maj. J. A. Turnbull.

Col. S. Westcott, C.B., C.M.G.; Capt. H. F. Wilkins, M.C.; Surg.-Gen. T. P. Woodhouse, C.B.

Consultants.—Temp. Col. Sir J. R. Bradford, K.C.M.G., C.B., F.R.S. (Maj., 3rd Lond. Gen. Hosp.), R.A.M.C.; Temp. Col. F. M. Caird (Lt.-Col., 2nd Sco. Gen. Hosp.), R.A.M.C.; Temp. Col. Sir B. E. Dawson, K.C.V.O., C.B. (Capt., 2nd Lond. Gen. Hosp.), R.A.M.C.; Temp. Col. W. T. Lister, C.M.G.; Temp. Surg.-Gen. Sir G. H. Makins, K.C.M.G., C.B. (Lt.-Col., 2nd Lond. Gen. Hosp.), R.A.M.C.; Temp. Col. C. S. Wallace, C.M.G.

Royal Army Medical Corps.

Maj. (temp. Lt.-Col.) D. Ahern; Capt. F. J. Allen; Temp. Capt. T. E. Amyot; Temp. Capt. W. A. Anderson; Lt.-Col. S. A. Archer; Temp. Capt. B. W. Armstrong.

Temp. Capt. V. E. Badcock; Capt. R. P. Ballard, Spec. Res.; Temp. Capt. S. Batchelor; Temp. Capt. J. Biggam; Lt. E. S. Bissell (since relinquished his commn.); Temp. Capt. A. G. Bisset. Capt. (actg. Lt.-Col.) J. D. Bowie; Temp. Capt. J. C. Boyd; Temp. Capt. C. A. Brisco; Temp. Capt. D. S. Brough; Temp. Capt. W. T. Brown; Capt T. W. Browne; Temp. Capt. C. W. G. Bryan; Capt. C. F. Burton, Spec. Res.

Capt. (actg. Lt.-Col.) E. D. Caddell, M.C.; Capt. A. Campbell; Temp. Capt. F. Carson; Temp. Capt. H. Carson; Temp. Lt. G. E. Chissell; Temp. Capt. C. N. Coad; Temp. Capt. H. M. Cockcroft; Temp. Capt. R. C. Cooke; Capt. T. F. Corkill, Spec. Res.; Capt. N. A. Coward; Capt. E. M. Cowell; Temp. Capt. E. W. Craig; Capt. R. S. Cumming.

Temp. Capt. J. Davidson; Temp. Capt. C. F. Dillon-Kelly; Temp. Capt. C. O. Donovon, D.S.O.; Temp. Capt. C. G. Douglas, M.C.; Capt. W. J. Dowling, Spec. Res.; Temp. Capt. (actg. Lt.-Col.) R. E. Drake-Brockman; Maj. (temp. Lt.-Col.) B. H. V. Dunbar; Temp. Capt. J. J. Dwyer.

Temp. Capt. H. D. Eccles; Capt. P. W. Edwards, Spec. Res.; Temp. Maj. (temp. Lt.-Col.) W. B. Edwards; Temp. Capt. C. M. G. Elliott; Temp. Capt. J. H. Elliott; Lt. (temp. Capt.) R. Ellis; Lt.-Col. C. R. Evans, D.S.O.

Temp. Capt. C. C. Finlator; Capt. (actg. Lt.-Col.) W. H. Forsyth; Capt. (actg. Lt.-Col.) A. D. Fraser, M.C., Spec. Res.; Temp. Capt. S. J. C. Fraser.

Temp. Capt. H. B. Germau (late Surg., R.N.); Temp. Capt. R. S. Gibson; Lt.-Col. G. H. Goddard; Temp. Maj. (temp. Lt.-Col.) E. L. Gowlland; Temp. Capt. N. F. Graham; Temp. Capt. N. Grellier.

Temp. Lt. A. A. Halliday; Temp. Capt. J. D. Hart; Temp. Capt. W. S. B. Hay; Maj. (temp. Lt.-Col.) H. C. Hildreth; Maj. (temp. Lt.-Col.) A. B. Hinde, Res. of Off.; Maj. (temp. Lt.-Col.) G. J. Houghton; Temp. Capt. G. W. Huggins; Maj. (actg. Lt.-Col.) A. J. Hull; Temp. Capt. D. M. Hunter; Temp. Capt. A. H. Huycke.

Capt. C. Jacobs, Spec. Res.; Temp. Capt. G. W. B. James; Capt. D. W. John, Spec. Res.; Temp. Capt. D. S. Jones; Temp. Capt. D. W. F. Jones.

Maj. (temp. Lt.-Col.) W. D. C. Kelly; Temp. Capt. J. Kirton; Temp. Capt. J. St. P. Knight.

Temp. Capt. H. A. Lake; Temp. Capt. F. J. Lidderdale; Capt. (actg. Lt.-Col.) A. S. Littlejohns; Lt.-Col. D. D. Logan.

Capt. P. McCallum, Spec. Res.; Temp. Capt. W. H. R. McCarter; Temp. Capt. W. McCready; Temp. Capt. N. MacDonald (Lt. Can. A.M.C.); Capt. (actg. Lt.-Col.) D. F. Mackenzie, D.S.O.; Temp. Capt. J. W. McKinney; Temp. Capt. J. W. McLeod; Temp. Capt. M. T. McMahon; Lt. (temp. Capt.) D. N. Macleod; Temp. Capt. R. J. B. Madden; Capt. (actg. Lt.-Col.) R. Magill, Spec. Res.; Capt. H. W. Maltby, Spec. Res.; Capt. D. M. Marr, Spec. Res.; Temp. Capt. J. R. Marrack, M.C.; Lt.-Col. E. W. P. V. Marriott; Capt. R. P. S. Mason, Spec. Res.; Temp. Capt. H. C. D. Miller; Temp. Capt. W. Millerick; Capt. F. R. H. Mollan, Spec. Res.; Capt. (actg. Lt.-Col.) C. R. M. Morris; Temp. Capt. R. S. Morshead; Temp. Capt. (actg. Lt.-Col.) F. F. Muecke; Capt. (actg. Lt.-Col.) K. D. Murchison, Spec. Res.; Capt. W. F. Munro.

Temp. Capt. K. M. Nelson; Capt. T. S. Nelson, Spec. Res.

Temp. Capt. H. B. Owens.

Temp. Capt. W. H. Parry; Capt. Owen G. Parry-Jones, Spec. Res. (died of wounds); Maj. J. S. Pascoe; Temp. Capt. M. P. Paton; Temp. Capt. D. H. Pennant, D.S.O.; Temp. Capt. S. R. Picken; Capt. L. T. Poole; Temp. Capt. J. H. Porter; Maj. (temp. Lt.-Col.) J. E. Powell; Temp. Capt. K. Pretty.

Maj. (temp. Lt.-Col.) J. Rahilly; Temp. Capt. M. Ramsay; Capt. A. Ramsbottom, Spec. Res.; Temp. Capt. G. A. Renwick; Temp. Lt.-Col. R. H. M. Roberts, C.M.G., T.D.; Temp. Capt. J. F. Robertson; Capt. (actg. Lt.-Col.) R. T. C. Robertson, Spec. Res.; Maj. (temp. Lt.-Col.) H. Rogers; Temp. Capt. W. Rogerson; Capt. J. C. Rowe; Temp. Capt. H. B. G. Russell; Temp. Capt. W. Russell; Capt. A. A. Rutherford.

Temp. Capt. A. P. Saint; Capt. J. A. C. Scott, M.C.; Capt. T. G. Shand; Temp. Capt. A. D. Sharp; Temp. Capt. T. Sheehan; Maj. (temp. Lt.-Col.) W. M. B. Sparkes, D.S.O.; Temp. Capt. G. R. Spence; Capt. A. H. Spicer; Maj. (temp. Lt.-Col.) H. Stewart, M.C.; Temp. Capt. A. V. Stocks.

Capt. (actg. Lt.-Col.) M. R. Taylor (late Capt. A. Med. Res.); Maj. (temp. Lt.-Col.) R. J. C. Thompson, D.S.O.; Temp. Capt. R. Tindall; Temp. Capt. R. W. L. Todd; Temp. Capt. W. A. Troup.

Capt. G. T. Van Der Vyver, Spec. Res.

Temp. Lt. K. M. Walker; Temp. Capt. R. B. Wallace; Lt.-Col. A. H. Waring; Capt. W. J. Webster, Spec. Res.; Capt. (actg. Lt.-Col.) A. G. Wells; Temp. Capt. G. R. C. Wilson; Temp. Capt. J. A. Wilson; Capt. C. S. E. Wright; Maj. (temp. Lt.-Col.) T. J. Wright.

Temp. Capt. H. Young; Capt. S. K. Young, Spec. Res.

Capt. W. W. Adamson; Capt. (temp. Maj.) E. Alderson; Capt. G. N. Anderson; Maj (temp. Lt.-Col) R. Coffey; Temp. Capt. J. Crawford, M.C.; Maj. (temp. Lt.-Col.) J. F. Crombie; Capt. (actg. Lt.-Col) H. K. Dawson; Capt. A. M. Deane; Capt. A. E. Delgado; Capt. S. R. O. Dudfield; Capt. H. Foxton; Lt.-Col. T. Fraser; Maj. G. E. Gask; Capt. A. F. Girvan; Capt. J. Golding; Maj. J. M. Gover; Capt. C. K. Gozney; Capt. J. M. Hamill; Maj. (temp. Lt.-Col.) G. H. L. Hammerton; Capt. W. H. P. Hey; Lt.-Col. F. W. Higgs; Lt.-Col. C. H. Howkins; Capt. A. M. Hughes; Lt.-Col. W. E. Hume; Maj. (temp Lt.-Col.) T. Kay; Temp. Capt. J. Kirker; Capt. H. W. Lance; Capt. H. Lightstone, M.C.; Maj. (temp. Lt.-Col.) C. H. Lindsay, C.M.G.; Capt. H. E. McCready; Capt. (actg. Lt.-Col.) G. Mackie; Capt. E. R. Matthews; Capt. G. L. Matthews; Capt. W. T. P. Meade-King; Capt. E. J. Messent; Maj. W. B. Millbanke; Maj. G. W. B. Miller,; Capt. B. B. Morgan; Capt. J. A. Nixon; Maj. (temp. Lt.-Col.) T. P. Puddicombe; Capt A. E. Rayner; Capt. D. G. Rice-Oxley; Maj. (temp. Lt.-Col.) D. Rorie; Capt. W. C. Stewart; Capt. (temp. Maj.) R. S. Taylor; Capt. A. P. Thomson; Capt. H. Vickers; Capt. J. S. Wallace; Maj. (temp. Lt.-Col.) R. M. West; Capt. L. T. Whelan; Capt. (actg. Lt.-Col.) A. J. Williamson; Lt.-Col. E. A. Wraith.

FOREIGN DECORATIONS.

Italian.

Order of St. Maurice and St. Lazarus: Cavalier.—Lt.-Col. W. W. Hearne, Australian A.M.C.

Order of the Crown of Italy: Commander.—Surg.-Gen. W. G. Macpherson, C.B., C.M.G., K.H.P.

Silver Medal for Military Valour.—Capt. H. H. Burnham, Canadian A.M.C.; Temp. Capt. H. N. M. Puckle, R.A.M.C.; Temp. Capt. M. Scott, R.A.M.C.; Temp. Capt. C. McM. Wilson, M.C., R.A.M.C.

THE SUPPLY OF MEDICAL OFFICERS FOR THE ARMY: POSSIBLE AMERICAN ASSISTANCE.

The Central Medical War Committee has been working steadily and at great pressure to meet the demands of the War Office for medical officers for the Army, and the position indicated in these columns some time ago as imminent has clearly been reached. In existing circumstances all the War Office demands cannot be met. The information that a large number of American medical men will shortly be available for service in France has been considered by many to promise an amelioration of the situation, but there is as yet no definite and official warrant for believing that the problem of an adequate supply of medical officers for the British Army will be solved in this way. Undoubtedly there are American medical men promptly available to serve for the time being with our Army or with the French Army, and probably more of the same gallant assistance will be forthcoming. Recognition of the qualifications of these American confrères by their Medical Association or statutory Colleges would enable them to be at once available for the armies at the Allied fronts. But these American doctors would probably have to be returned to the American Army when expeditionary forces begin to arrive from the United States. A temporary respite from acute trouble, however, might be gained through the employment of American doctors, and such respite would be valuable to this country where the supply of medical men has become so dangerously short. The subject is now under the discussion of the Central Medical War Committee. No one who is aware of the circumstances in which exemption is refused or obtained by our medical men of military condition can possibly suggest that the Central Medical War Committee takes other than a very high view of its responsibilities towards the Army. It has, however, an enormously important duty towards the civilian population in this country, and cannot be blind to it. So closely have the areas in England been scrutinised with a view to obtaining every medical officer for the Army, so intensive is the method of investigation and reinvestigation now being conducted, that it seems certain that should all this energy and self-sacrifice not bear sufficient fruit the Army will have to economise in the employment of medical men under some plan of redistribution or reorganisation. There are already men being sent into the Army who can badly be spared by the State.

HAMPSTEAD MEDICAL WAR COMMITTEE.

Having regard to the fact that medical men who have relinquished their commissions in the Army are now returning to practise, the following resolution was recently passed by the Committee:—

> This Committee is of opinion that there should be no receding from the terms of the undertakings issued by this or other Medical War Committees, No request from returning doctors should absolve the members of the profession from their obligations incurred by the undertakings.

The resolution was occasioned on account of the apparent disloyalty of some members of the public towards the men who have sacrificed so much by accepting commissions, although over military age. If the members of the profession are loyal to their undertakings it is hoped that the laity will learn from them.

The undertaking referred to is one which was almost universally signed and agreed to in November, 1915, and will be remembered by all our readers.

AN IMPERIAL MEDICAL AND NURSING SCHEME.

Sir J. Kingston Fowler, late consulting physician to the Army in France, has issued through Messrs. Macmillan and Co., in the form of a pamphlet, a scheme for the organisation of the medical and nursing professions of the Empire for war, in the hope that it may serve to stimulate imagination and thought and foster *esprit de corps*. Beginning with a tribute of praise to the splendid work of the Royal Army Medical Corps, both Regular and Territorial, during the war, and to the foresight and ability of Sir Alfred Keogh, K.C.B., who organised the medical services of the Territorial Force, thus enabling the country to provide fully equipped hospitals ready to receive patients before the wounded arrived from France, he says, "this should not lead us to think that perfection has been attained ..... and every effort should be made to ensure that the experience now in many minds is not lost after the war is over, but is utilised for our future advantage." After describing the medical service of the old Volunteer Force, which had many defects, and the existing system under the Territorial Force, he outlines the proposed scheme which is to utilise the sentiment of attachment to the medical schools as a factor in the organisation of the medical profession for war.

Any scheme of the kind must fulfil certain conditions: It must be independent of the form of military service, whether voluntary or compulsory, or territorial; it must be flexible and capable of unlimited expansion; it should be applicable to the whole Empire; it must recognise that allegiance to an Alma Mater may by long association with another institution be transferred; it must provide for men who have no such allegiance; it must have regard to those universities which only make provision for the preliminary and intermediate subjects of a medical education; it must recognise that in the Scotch universities the number of graduates is so large that the sentimental attachment is, as regards some of them, possibly weaker than obtains in the London schools; provision must be made for the inclusion of general hospitals situated in large towns in which there is no medical school, as in regard to these hospitals there is a strong feeling of attachment amongst the medical men of the town and county; the names given to the hospital units must be reminiscent of their origin and of Home. While it is true that the mention of a number may be a powerful aid to the imagination, as witness the numbers of many regiments, in relation to hospital units numbers are weak. The regiment never dies; its traditions are quickly learned by the recruit, but the hospital units are formed *ad hoc*, and after a war is over they disappear, and any *esprit de corps* that may have been evoked is lost and forgotten.

The proposal is to name the hospitals after the school, college, university, or town from which the personnel has been drawn, and which in each case forms the bond uniting the individual members of the staff to one another. For example, such names as No. 1 London General Hospital, R.A.M.C. (T.), No. 1 Northern General Hospital, R.A.M.C. (T.), and all the others so named would disappear from the Army List and would be replaced by No. 1 Oxford University, No 1 Cambridge University, No. 1 Edinburgh University, No. 1 St. Bartholomew's Hospital. The permanent staff of a centre would consist of the commanding officer, the adjutant, the quartermaster, and a certain number of orderlies. The duties of the commanding officer and adjutant in time of peace would be—

To receive all communications from the War Office and to carry the regulations into effect; to keep the mobilisation roll; to receive applications for admission to the roll, and to accept or refuse them; to classify the applicants according to their attainments and record of work; to recommend officers for commissions in the units under their control; to keep up the personnel of at least one complete general hospital, and usually of two or more such hospitals—of these No. 1 would be for service in this country; No. 2 possibly for service abroad;—to carry out the regulations as to the training of the orderlies; to receive the order "Mobilise," and to carry it into effect; in time of war to maintain the personnel of their units and to provide drafts for the units of the fighting line as required by the War Office. The number of names on any roll would necessarily be far greater than would be required to maintain the personnel of the units for which the centre was responsible.

The personnel of No. 1 Hospital of any centre would consist of seniors—i.e., physicians, surgeons, officers in charge of special departments—who would serve in the military hospital at home. No officers liable for general service abroad in time of war should be appointed to No. 1 Hospital of any centre. The staff of No. 2 would consist of younger members of the honorary staff, with a similar complete personnel necessary for a general hospital abroad. Similarly with No. 3, and so on. Each hospital, whether serving abroad or at home, should be provided with a fully equipped bacteriological laboratory which is essential in the interest of the patients. Probably in many cases the institution or town responsible for the units would provide, as a gift, the laboratory and X ray outfit.

Among the advantages claimed for the scheme are its applicability to the whole Empire and its elasticity. The organisation of the nursing profession would follow broadly on the lines already suggested for the medical profession.

THE TREATMENT OF THE WAR CRIPPLE.

The statement by the Minister of Pensions, on which we commented last week, has now been supplemented by a very welcome circular addressed by the President of the Local Government Board to boards of guardians in regard to discharged disabled soldiers and sailors detained in Poor-law institutions. Under the terms of the new Royal Warrant any disabled man who is in receipt of a pension and has been recommended for special treatment in a sanatorium or other institution is entitled to an allowance of not less than 27*s.* 6*d.* a week for himself and an appropriate allowance for his wife and children, the local War Pensions Committees being charged with the duty of making the requisite arrangements for the institutional treatment of men residing within their area. In view of these provisions, the circular states, no discharged disabled man should in future be under the necessity of seeking Poor-law relief in a workhouse or infirmary in any case where the incapacity from which he is suffering is due to his disablement. The guardians are asked to communicate with the local War Pensions Committee of their area in regard to any such cases at present in institutions under their control. Future applications from discharged men should be referred at once to the local War Pensions Committee. The proposed surrender of the functions of the Statutory Pensions Committee to the Ministry of Pensions should serve still further to unify procedure.

THE UNITED STATES AND MEDICAL ORGANISATION FOR THE WAR.

The Sanitary Service in the Field.—In the field, according to the *Journal of the American Medical Association*, the sanitary service of the United States Army is divided into two sections—for the zone of advance and the line of communications. In the first zone the mobile sanitary units are located, the second being specially concerned with supply and the evacuation of sick and wounded. The general arrangements are similar to those in the large European armies. With each division there are four ambulance companies under a director, each company consisting of 5 medical officers and 79 enlisted men, with 12 ambulances and 3 wagons for the transport of supplies. On going into action immediate first-aid is performed by the sanitary detachments belonging to each regiment. Dressing stations are established at various parts of the field as required on the notification of the divisional surgeon, from which the wounded are removed to field hospitals in the rear. Four field hospital units are attached to a division under the control of a director of field hospitals, each to accommodate 216 patients, and with a personnel of six medical officers and 67 enlisted men. Where existing buildings are not available tents are to be erected. The field hospitals themselves can be evacuated as quickly as possible and the wounded removed to hospitals further in the rear. It is here that the Red Cross organisation comes into play. A motor transport is now being organised. The medical service on the lines of communication, which may nowadays be anything from 50 to 300 miles, is in charge of a surgeon stationed at the base, with a second to supervise the evacuation of the wounded from the time of leaving the field hospital until reaching the hospital train for the base. To prevent congestion on the railways bringing up supplies, two evacuation hospitals at the head of the line of communication are allotted to each division, each with a personnel of 14 officers and 153 enlisted men. These hospitals have a normal capacity of 432 beds, with sufficient supplies on hand to provide for sudden expansion. In the same hospitals complete treatment is provided for those who cannot be removed further owing to the serious nature of their wounds, and for those who will recover completely within a week or ten days. Evacuation from the line-head to base will eventually be carried out by fully-equipped hospital trains, providing the same care as a permanent hospital. Only one such train is at present ready for use. Base hospitals will have a capacity of 500 beds each with a personnel of 20 officers, 153 men, and 46 female nurses, but will be able to provide double accommodation at short notice. A convalescent camp is connected with each base hospital.

OBITUARY OF THE WAR.

FRANK ALBERT SYMONS, C.M.G., D.S.O., M.B. EDIN.,

TEMPORARY COLONEL, ROYAL ARMY MEDICAL CORPS.

Colonel F. A. Symons, who was killed on April 30th, was son of the late John Hughes Symons, of Nova Scotia, and received his medical education at Edinburgh University, qualifying M.B., C.M. in 1891. On the outbreak of the present war he was one of the first to leave England in command of a clearing hospital with the rank of lieutenant-colonel, and he had been abroad ever since. In November, 1915, he became temporary colonel and later Assistant Director of Medical Services. He was twice mentioned in Lord French's despatches, received the D.S.O. in the first honours list of the war, and was made a C.M.G. in the New Year honours list of the present year. He served in the South African War, where he was military secretary to the late Sir William Mac Cormac, with whom he was present at the battle of Colenso and the relief of Ladysmith.

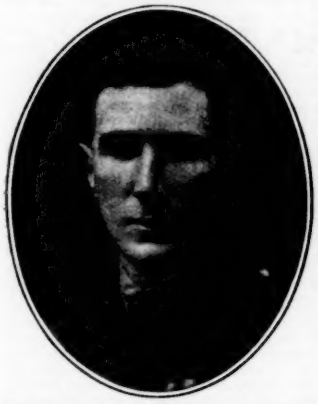
"Colonel Symons was a splendid organiser and indefatigable worker," his Divisional General writes, "and these qualities, together with his cheery, tactful manner, won for him the affectionate regard of officers and men." Another writes of him as a valued senior medical officer, whose judgment in difficult situations was sound and practical.

Colonel Symons married in 1900 Dorothy, second daughter of the late Edmund Grove Bennett, of The Close, Salisbury, and leaves a widow and four children.

JAMES ELLIOT BLACK, M.B., CH.B. GLASG.,

MILITARY CROSS;
CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain J. E. Black, who was recently killed on active service in France, was the son of the late Adam Elliot Black, of Glasgow. He was educated at Cargillfield and Fettes College, graduating in medicine at Glasgow University in 1911. When war broke out he was studying for his D.P.H. Cambridge, but immediately volunteered for service, leaving in October, 1914, for France, where he was attached to a clearing hospital. He was one of the first medical officers to deal with drift-gas poisoning, and the results of observations on 685 such cases by himself and others were embodied in a paper published in the *British Medical Journal* of July 31st, 1915. In April, 1915, he was promoted to the rank of captain, and in January of the following year his name was mentioned in despatches. Later he became attached to the 8th Bedfordshire Regiment. His award of the Military Cross was recorded in THE LANCET of Nov. 18th last year for conspicuous gallantry and devotion to duty in the field. "He rendered valuable services when attending the wounded under heavy machine gun and shell fire. Later, he went out into 'No Man's Land' to succour the wounded." One of his fellow-workers in the pathological institute of the London Hospital, where he acted as assistant in 1912, writes: "An indefatigable worker in spite of poor health, gentle and kindly, always ready to help, modest to a degree which made him ignorant of his exceptional ability and of the value of his work, Captain Black had a personal charm which endeared him to all his colleagues."



ROBERT HOME, M.B., C.M. TOR.,

CAPTAIN, ROYAL ARMY MEDICAL CORPS.

Captain R. Home, who was recently reported killed on active service, was born in Toronto in 1890, graduating at his home University in 1913. Entering the Canadian Army Medical Corps, he served at the Military Hospital at the Exhibition Camp, Toronto, transferring to the Royal Army Medical Corps in November, 1915; at first with the 107th Field Ambulance, he was later medical officer of the 14th Gloucesters.

JOHN MARSHALL, M.B., CH.B. EDIN.,

LIEUTENANT, ROYAL ARMY MEDICAL CORPS.

Lieutenant J. Marshall, who was reported missing, believed drowned, on April 15th, was 30 years of age and eldest son of the late Alderman R. Marshall, J.P., of Berwick-on-Tweed. From Berwick Grammar School, where he was Johnston scholar and prizeman, he entered Edinburgh University, graduating M.B. Ch.B. in 1908 with first-class honours and the award of the McCosh travelling scholarship. After studying in Paris and Munich he was appointed house surgeon at Greenbank Hospital, Darlington, where he remained two years, leaving to become assistant to Dr. P. F. Mannix, of Lancaster. Latterly he had been resident at the Beaufort War Hospital, Bristol, until February of the present year, when he obtained a commission in the Royal Army Medical Corps. One of his intimates writes of him as a most unselfish man, respected and beloved by his patients, particularly by the poor.

GUY BROOKE BAILEY, M.B., B.S. MELB.,

CAPTAIN, AUSTRALIAN ARMY MEDICAL CORPS.

Captain G. B. Bailey, who was killed in the recent fighting in France, was 34 years of age at the time of his death and a medical graduate of Melbourne University. During his University career he took a prominent part in athletics, representing Trinity College in cricket and rowing. He was practising in Hobart, Tasmania, prior to joining the Australian Imperial Force. He leaves a widow and one child.

CLIVE BRITTEN BURDEN, M.B., CH.B. ADEL.,

CAPTAIN, AUSTRALIAN ARMY MEDICAL CORPS.

Captain C. B. Burden, who died on May 8th, aged 25 years, from injuries accidentally received, was the son of J. B. Burden, of Adelaide. He recently graduated in medicine at Adelaide University, where he was popular with his fellow students for his genial disposition and his skill in athletic sports. Joining the Australian Imperial Force in July last, he came over as a general reinforcement officer early in the present year, and later saw service in France. His loss is felt by brother officers here and by his many University friends in Australia.

ANOTHER HOSPITAL SHIP TORPEDOED.—On May 26th, at 6 P.M., the hospital ship *Dover Castle* was struck by a torpedo without warning in the Mediterranean and was sunk two hours later as the result of a second torpedo. All the patients and hospital staff were saved, as well as the whole crew with the exception of six men who were injured by the explosion.

GIFTS TO THE RED CROSS SOCIETY.—The Joint Finance Committee of the British Red Cross Society and the Order of St. John has received £5000, the result of an appeal made on behalf of the sick and wounded of the British armies by the Imperial Red Cross Committee of Newfoundland.

As a result of the Red Cross Sale held by Messrs. Christie in March and April last, £84,157 have been received by the British Red Society and the Order of St. John. The sale in 1915 produced £38,215, and that in 1916 £52,691.

WAR HOSPITAL MAGAZINES.—The May issues of the *Craigleith Hospital Chronicle* (Craigleith, Edinburgh, 6*d.*), the *Gazette of the 3rd London General Hospital* (Wandsworth, 4*d.*), and the *War Hospital Magazine* (Huddersfield, 3*d.*), maintain their standard, both in letterpress and illustration, making an appeal to the inmates and staffs of the hospitals they represent, as well as to the general public. The same may be said of the April issue of the *Ration* (Reading, 2*d.*). The profits on all these magazines are devoted to the provision of extra comforts for the hospital inmates, and we note with regret that, owing to the scarcity of paper, among other things, the *Craigleith Hospital Chronicle*, one of the earliest and best of this class of periodicals, will disappear as a monthly with the next issue. An occasional number may be issued from time to time.

A NAVAL FLEET-SURGEON'S IMPRESSIONS IN THE TRENCHES.—In order to strengthen the sympathetic bond between the sister services the Admiralty and War Office made arrangements in 1916 to send a certain number of naval officers to gain experience of trench life and a corresponding number of army officers to experience life afloat under war conditions. Fleet-Surgeon C. Marsh Beadnell, R.N., was one of the privileged officers of the Navy to visit the trenches, and the interesting account of his impressions, which was published in the January and April issues of the *Journal of the Royal Naval Medical Service*, has now been reprinted in the form of a pamphlet and published by Messrs. John Bale, Sons, and Danielsson, Great Titchfield-street, W. Naturally, the six days which the author spent in the trenches afforded only a glimpse of real trench life, but his observational powers enabled him to take in every detail which that glimpse afforded, and a useful as well as an interesting description with many humorous touches is the result. There is a description of the medical arrangements and an account of gas attacks, the routine to cope with this offensive, and the effects of the gas on man, animals, and vegetation. The itinerary includes a visit on foot to the firing trenches, a trip down the sap, and below No Man's Land.

Medical News.

SOCIETY OF APOTHECARIES OF LONDON.—The following candidates have passed in the subjects indicated:—

Surgery.—W. A. Bibby, Manchester; H. N. Dale-Richards (Sect. I.), St. Mary's Hospital; E. F. Deacon (Sect. I.), Guy's Hospital; J. Y. Dent (Sects. I. and II.), King's College Hospital; S. G. K. Kastelianski (Sect. II.), London Hospital; R. H. Pettersson (Sects. I. and II.), St. George's Hospital; G. W. Pratt (Sects. I. and II.), Cambridge; and F. A. Unwin (Sect. II.), Westminster Hospital.

Medicine.—E. A. Leak (Sect. I.), Cambridge and London Hospital; R. H. Pettersson (Sect. II.), St. George's Hospital; and L. J. Vincent (Sects. I. and II.), Cambridge and St. Mary's Hospital.

Forensic Medicine.—E. F. Deacon, Guy's Hospital; E. W. Diggett, Jefferson College, Philadelphia; L. E. Lewis, Glasgow; and D. Menzies, St. Mary's Hospital.

Midwifery.—G. S. Ashby, King's College Hospital; E. F. Deacon, Guy's Hospital; and M. Ibrahim, Middlesex Hospital.

The Diploma of the Society was granted to the following candidates, entitling them to practise medicine, surgery, and midwifery:—J. Y. Dent, S. G. K. Kastelianski, R. H. Pettersson, F. A. Unwin, and L. J. Vincent.

THE LATE MR. W. LE PAGE.—The death occurred on May 13th, at his residence in Guernsey, of William Le Page, L.R.C.P. Edin., L.F.P.S.Glasg., and L.M., aged 75, who was well known in the island. He was the son of Mr. Le Page and Amelia de Jersey and studied medicine at Durham University. He qualified by taking the triple qualification of Edinburgh and Glasgow. He had been a surgeon-lieutenant-colonel in the Royal Guernsey Militia, surgeon to St. Peter Port Hospital, surgeon to the Castel Hospital, and physician to the Castel Lunatic Asylum. He leaves a widow to mourn her loss.

LITERARY INTELLIGENCE.—Messrs. J. and A. Churchill announce the forthcoming appearance of a book entitled "Massage, its Principles and Practice," containing original photographic illustrations, by Dr. J. B. Mennell, physician to the Military Orthopædic Hospital, Shepherd's Bush, and one on "Surgical Nursing and After-treatment," containing over 100 illustrations, by Dr. H. C. R. Darling, assistant surgeon to South Sydney Hospital.

MEDICO-PSYCHOLOGICAL ASSOCIATION OF GREAT BRITAIN AND IRELAND.—The annual meeting of this association will take place on July 25th, at 11, Chandos-street, Cavendish-square, London, W. The meeting, as in 1915 and 1916, will be held on one day only. In accordance with a by-law of the society, Dr. R. H. Steen, the acting honorary general secretary, requests the contribution of papers and other scientific matter. Dr. Steen may be addressed at the City of London Mental Hospital, Dartford, Kent.

THE annual general meeting of the Röntgen Society will be held on Tuesday, June 5th, at 8.15 P.M., at the Cancer Hospital (Free), Fulham-road, S.W. The adjourned discussion on the Future of the British X Ray Industry, will be opened by Captain R. Knox. Lieutenant-Colonel Robert Wilson, C.A.M.C., Mr. J. H. Webb, and Mr. Howard C. Head are expected to take part.

THE LATE MR. PETER MACEWAN, F.C.S.—We regret to learn the sudden death last week of Mr. Peter MacEwan, the editor of the *Chemist and Druggist*. His literary contributions to scientific pharmacy were numerous and valuable, and his knowledge of all the legal enactments dealing with his profession was intimate.

ROYAL MEDICAL BENEVOLENT FUND.—At the last meeting of the committee, held on May 8th, 25 cases were considered, and £213 granted to 21 of the applicants. The following is a summary of some of the cases relieved:—

Wife, aged 56, of M.R.C.S. Eng. who practised at New Zealand and Hoxton. Applicant's husband has been paralysed for 23 years, and the little income he has is insufficient to support them. The wife prior to the war was able to earn as a teacher of music and languages, but cannot obtain pupils at present; and their only son, who used to help, has recently joined the Army and married. Voted £15 and referred to the Guild.—M.R.C.S. Eng., aged 74, married, who practised at Darlington and Malvern. Owing to ill-health and insufficient means, and the increased cost of living, unable to pay his way. His wife has recently broken her leg. Only income about £100 a year from son and friends. Rent £25. Voted £18 in 12 instalments.—Widow, aged 67, of M.R.C.S. Eng. who practised at Leighton Buzzard, and died in 1904. Applicant lost the small capital she had through fraudulent executors. Only income now 11*s.* per week provided by relatives. Pays 5*s.* 6*d.* per week rent; and high price of food makes it impossible for her to manage. Voted £12 in 12 instalments.—Widow, aged 46, of M.R.C.S. Eng. who practised at Brixton, and was an annuitant of the fund. Applicant left without means, and health very much impaired by the constant nursing, for the last eight years, of her husband, who was a chronic invalid. She hopes, after a rest, to find suitable employment, and then manage to earn a living. Voted £5. Widow, aged 58, of L.R.C.P. Edin. who practised at Blackburn, and died in 1902. Applicant was left unprovided for with a young daughter, now aged 19. Both have recently obtained work through the help of the Manchester branch of the Guild, and the prospects are brighter than they have been before, but they still require a little help to get their affairs straight, owing to their previous strenuous times. Relieved four times, £40. Voted £5.—Widow, aged 73, of M.R.C.S. Eng. who practised at Liverpool and died in 1887. Applicant kept house for her son, a medical man, who died in 1915 after a very strenuous time on war work. Applicant lives in own house, but it is heavily mortgaged. Takes in paying guests, but does not make sufficient to meet her liabilities. Relieved once, £10. Voted £10.—Widow, aged 41, of M.D. Glasg. who practised in London and died in 1910. Left entirely without means and has defective eyesight. In the summer months she earns 15*s.* a week as an attendant. In the winter months only has casual employment. Health has been very indifferent lately. Relieved twice, £20. Voted £10 in two instalments.—Daughter, aged 62, of L.S.A. Lond. who practised at Cheadle and died in 1874. Owing to ill-health and advancing years, unable to undertake permanent work. Friends allow her £25 a year. She earns about £5 by sewing. Relieved 11 times, £100. Voted £15 in 12 instalments.—Widow, aged 45, of L.S.A. Lond. who practised at Swansea and died in 1915. Was left entirely without means with three children. The eldest was taken by a relative, and the daughter, now aged 17, is being educated by the Guild. Applicant has had post as working housekeeper, but has recently had to give this up. Relieved once, two years ago. Voted £10 in two instalments.—Wife, aged 50, of M.R.C.S. Eng. who practised at Bournemouth. She and her daughter were deserted by her husband some years ago, being left entirely without means. The applicant is a chronic invalid, and the daughter is only able to earn a little by casual employment. Relieved four times, £38. Voted £12 in 12 instalments.—Widow, aged 63, of L.R.F.P.S. Glasg. who practised at Irvine and died in 1899. Applicant left without means, and she suffers from chronic rheumatism and sciatica. Manages to earn a little by letting rooms, but not sufficient to live on. Relieved three times, £36. Voted £12 in 12 instalments.—Daughter, aged 58, of L.S.A. Lond. who practised at Bow and Forest Gate. Applicant has to look after invalid father, who is an annuitant of the Fund, and owing to the high price of food finds it difficult to manage. Relieved once, £10. Voted £10 in two instalments.—Daughter, aged 41, of L.S.A. Lond. who practised at Bermondsey and died in 1887. Applicant's mother, who has just died, had

recently born helped by the Fund. The Guild propose training applicant as a shorthand typist, and placing her in a position to earn her own living. Voted £5.—Daughter, aged 51, of F.R.C.S. Eng. who practised at Biggleswade, and died in 1890. Applicant is a chronic invalid and unable to undertake any permanent work. Relieved 18 times, £165. Voted £12 in 12 instalments.—Daughter, aged 51, of M.R.C.S. Eng. who practised at Peckham and died in 1885. Applicant suffers from neuritis and defective eyesight and was only able to earn £2 last year. Only other income £20 from sister. Relieved 19 times, £221. Voted £15 in 12 instalments.—Daughter, aged 57, of M.R.C.S. Eng. who practised in London and other places and died when applicant was a child. For many years applicant had a very strenuous time, and last year commenced as a munition worker and was doing well, but was unfortunately knocked down by a 'bus in December last and was in the infirmary for almost four months. Is now staying with relations, who are unable to keep her. She hopes to get some compensation. Relieved twice, £10. Voted £12 in 12 instalments.

Subscriptions may be sent to the acting honorary treasurer, Dr. Samuel West, at 11, Chandos-street, Cavendish-square, London, W. 1.

Mr. V. Warren Low, C.B., M.D., F.R.C.S., has been appointed External Examiner in Surgery to the London University.

THE death is announced of Dr. J. Mitford Atkinson, for many years superintendent of the Government Civil Hospital at Hong-Kong.

THE DALRYMPLE INEBRIATE HOME.—The report of the Homes for Inebriates Association for the year ending Jan. 31st, 1917, includes the report for that year of Mr. F. S. D. Hogg, the medical superintendent of Dalrymple House, Rickmansworth. Mr. Hogg makes the interesting comment, in noting that readmissions have during the year been unusually numerous, that this has been due to good but ill-timed intentions on the part of the patients. "Men," he says, "have been over-anxious to obtain admission into the Army or Navy, or to return to a business or profession which is being neglected owing to scarcity of staff or substitutes, or they have been hit by the war and cannot afford to be away from their work. Whatever the reason, the period of treatment is curtailed, and a strenuous life has to be faced by one who is not yet fit to undertake such duties and who has not yet sufficiently recovered from the effects of alcohol or drug addiction."

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

Venereal Disease Act.

THE Venereal Disease Act, 1917, has received the Royal Assent.

Whitsuntide Recess.

Parliament has adjourned for the Whitsuntide Recess.

HOUSE OF COMMONS.

WEDNESDAY, MAY 23RD.

Medical Re-examinations.

Mr. HOGGE asked the Under Secretary for War whether a discharged man recalled for examination under the Military Service (Review of Exceptions) Act could insist upon the Medical Board producing his medical history.—Mr. MACPHERSON replied: The answer is in the negative.

Epileptics and the Army.

Mr. HOGGE asked the Under Secretary for War whether there was an Army Order which forbade the discharge of epileptics from the Army.—Mr. MACPHERSON answered: The instructions issued on Dec. 9th on this point lay down that a soldier suffering from epilepsy will not be discharged on that ground alone unless his incapacity is such as to unfit him for any military employment suitable to C 3 men. He will be re-classified in a category from which men are eligible for transfer to Class P or P (T) of the Reserve.

THURSDAY, MAY 24TH.

Fees of R.A.M.C. Officers.

Sir G. TOULMIN asked the Financial Secretary to the War Office whether a captain in the Royal Army Medical Corps serving in a military hospital was entitled to charge a fee for filling up a statement required by a life association in reference to a man who had died under his charge.—Mr. H. FORSTER wrote in reply: I am not aware why any fee ordinarily payable by a life association should not be charged.

FRIDAY, MAY 25TH.

Medical Re-examinations.

Mr. NEEDHAM asked the Under Secretary for War what procedure was open to a man called up for examination under the Military Service (Review of Exceptions) Act, 1917, who was dissatisfied with his medical classification, to have his case submitted to a Medical Appeal Board.—Mr. MACPHERSON replied: An application to be examined by a special Medical Board is submitted for the consideration of the War Office by the military representative in a case where such examination is recommended by a military service tribunal before which the man concerned has laid his case.

Mr. PRINGLE: Are we to understand that he cannot get an appeal to a special Medical Board except through a tribunal?—Mr. MACPHERSON: That is so.

Replying to Mr. NEEDHAM, Mr. MACPHERSON said: The special Recruiting Medical Board at Leeds deals with cases of disputed medical classification of men resident in the North of England which tribunals recommend should be sent to an Appeal Board. The recommendations of the tribunals are submitted to the War Office along with the necessary documents in each case. Men sent to the special Medical Board for examination are provided with travelling warrants and with subsistence if detained overnight.

Answering Mr. T. TAYLOR, who asked whether examinations of recruits by the Medical Boards had frequently been made at the rate of 30 per hour, Mr MACPHERSON said that he was not aware of any instance in which recruits had been examined at the rate mentioned. Express instructions had been issued that examinations under the Military Service (Review of Exceptions) Act should be most careful. The classification certificate was signed by the president of the board.

In the course of the debate on the adjournment motion, Mr. MACPHERSON said that members of Medical Boards were just as sympathetic to men called up for examination under the Military Service (Review of Exceptions) Act as any Members of the House of Commons. At least 75 per cent. of the members of the Medical Boards were civilian practitioners. It was the invariable practice that two of every three doctors on those boards were civilians, and if it were true—and he thought it was true—that there was a proportion of two-thirds of three members of the board civilian, then to say that two-thirds was dominated by the remaining third passed his comprehension.

Cromarty Camp Hospital Huts.

Mr. ANDERSON asked the Under Secretary for War whether 25 of the huts in the Cromarty Military Camp were being used for cases of venereal disease.—Mr. MACPHERSON replied: No, sir. The scheme has been abandoned and other arrangements will be made.

Appointments.

Successful applicants for vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward to THE LANCET Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week, such information for gratuitous publication.

COLLINS, P., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Rathmore District of the County of Kerry.

ROYAL FREE HOSPITAL.—Acting Assistant Physician: CUTHBERT, HAZEL, H., M.D. Lond. Senior Resident Medical Officer: DEARNLEY, GERTRUDE, M.D. Lond. Junior Obstetric Assistant: DIXON, Miss.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

When the application of a Belgian medical man would be considered the advertisers are requested to communicate with the Editor.

BIRMINGHAM CITY EDUCATION COMMITTEE.—Temporary Assistant School Medical Officer. Salary £300 per annum.

BRIGHTON COUNTY BOROUGH ASYLUM, Haywards Heath.—Assistant Resident Medical Officer for 4 or 5 weeks. Salary £8 6s. per week and travelling expenses.

BRISTOL GENERAL HOSPITAL.—Casualty House Surgeon. Salary at rate of £175 per annum, with board, &c.

BRISTOL ROYAL HOSPITAL FOR SICK CHILDREN AND WOMEN.—Female House Physician. Salary £150 per annum, with board, &c.

BRISTOL ROYAL INFIRMARY.—House Physician and House Surgeon. Salary at rate of £120 per annum, with board, &c.

BROMLEY EDUCATION COMMITTEE, Kent.—School Medical Officer. Salary £300 per annum.

CAPE TOWN, SOUTH AFRICAN COLLEGE.—Professors of Pharmacology, Pathology, and Bacteriology. Salary at rate of £800 per annum each.

CARDIFF, KING EDWARD VII.'s HOSPITAL.—House Surgeon for six months. Salary at rate of £175 per annum, with board, &c.

CHESTER ROYAL INFIRMARY.—House Physician and Assistant House Surgeon. Salaries £150 per annum, with board, &c.

DARLINGTON GENERAL HOSPITAL.—House Surgeon. Salary £200 per annum, with board &c.

DEVONPORT, ROYAL ALBERT HOSPITAL.—House Surgeon, unmarried. Salary £150 per annum, with board, &c.

GRIMSBY AND DISTRICT HOSPITAL.—House Surgeon. Salary £5 5s. per week, with board, &c.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton. House Physician for six months. Salary 30 guineas. Also Resident Medical Officer. Salary £200 per annum, with board, &c.

ITALIAN HOSPITAL, Queen-square, London, W.C.—House Surgeon for six months. Salary £80 per annum, with board, &c.

LEICESTER EDUCATION COMMITTEE.—Two Assistant School Medical Officers (Temporary). Salary £300 per annum.

LIVERPOOL EYE AND EAR INFIRMARY, Myrtle street.—Female House Surgeon. Salary £150 per annum, with board, &c.

LONDON COUNTY ASYLUMS, Bexley, Kent, and Long Grove, Epsom.—Temporary Assistant Medical Officers. Salary 6 guineas per week, with board, &c.

MANCHESTER CHILDREN'S HOSPITAL, Pendlebury, near Manchester.—Two Female Resident Medical Officers, unmarried. Salary at rate of £100 per annum.

MANCHESTER, CORPORATION OF.—Temporary Assistant Tuberculosis Officer. Salary £450 per annum.

MILITARY HOSPITAL, Richmond, Surrey.—Whole-time Medical Officer. Salary 24s. per diem.

NEWCASTLE-UPON-TYNE, ROYAL VICTORIA INFIRMARY.—Resident Medical Officer. Salary as arranged, with board, &c.

NEW HOSPITAL FOR WOMEN, Euston-road.—Female House Physician, Obstetric Assistant, Two House Surgeons. Salary £50 per annum, with board, &c. Also Resident Medical Officer at House of Recovery, New Barnet. Salary £60 per annum.

NOTTS EDUCATION COMMITTEE.—Assistant School Medical Officer. Salary £350 per annum.

QUEEN CHARLOTTE'S LYING-IN HOSPITAL, Marylebone-road, N.W.—District Resident Medical Officer for four months. Salary at rate of £60 per annum, with board, &c. Also Pathologist and Registrar. Salary at rate of £80 per annum, with lunch.

QUEEN MARY'S HOSPITAL FOR THE EAST END, Stratford.—Casualty Officer.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—House Physician, Casualty House Surgeon, and House Surgeon for six months. Salary £100 per annum, with board, &c.

ROYAL FREE MILITARY HOSPITAL, London, W.C.—Assistant Resident Medical Officer.

SHEFFIELD, JESSOP HOSPITAL FOR WOMEN, GYNÆCOLOGICAL AND MATERNITY DEPARTMENTS.—Junior Female House Surgeon, unmarried. Salary £200 per annum, with board, &c.

SHEFFIELD ROYAL INFIRMARY.—House Physician. Salary £120 per annum, with board, &c.

SOUTH LONDON HOSPITAL FOR WOMEN, South Side, Clapham Common, S.W.—Female House Surgeon for six months. Salary at rate of £100 per annum, with board, &c.

STOCKPORT, COUNTY BOROUGH EDUCATION COMMITTEE.—School Medical Officer. Salary £300 per annum.

SWANSEA EDUCATION COMMITTEE.—Female Assistant School Medical Officer. Salary £300 per annum.

WORCESTER, KING EDWARD VII. MEMORIAL SANATORIUM, Knightwick, near Worcester.—Temporary Medical Superintendent and Tuberculosis Officer. Salary £450 per annum, with board, &c.

THE Chief Inspector of Factories, Home Office, London, S.W., gives notice of a vacancy for a Certifying Surgeon under the Factory and Workshop Acts at Chew Magna, Somerset.

Births, Marriages, and Deaths.

BIRTHS.

BROWN.—On May 23th, at Adelaide, South Australia, to Dr. and Mrs. Gilbert Brown, of Snowtown, South Australia, a son. (By cable.)

DAW.—On May 20th, at a nursing home, Leeds, the wife of S. W. P. Daw, F.R.C.S., Captain, R.A.M.C., T., Park-square, Leeds, of a son.

HALL.—On May 24th, at a nursing home, the wife of Fleet-Surgeon J. Falconer Hall, Royal Navy, of a daughter.

REW.—On May 25th, at "Wotton Grange," Bedfont, Middlesex, the wife of Lieutenant G. Russell Rew, R.A.M.C., of a son.

MARRIAGES.

HEBBLETHWAITE—KING.—On May 24th, by licence, at St. George's Church, Leeds, Captain Arthur Stuart Hebblethwaite, M.C., R.A.M.C.(T.), to Elsie Langtry, second daughter of Mr. W. H. King, Bollerton, Cheshire.

ROBBINS—DUCHESNE.—On May 28th, by special licence, Captain Frank Hubert Robbins, R.A.M.C.(T.), to Dorothy Muriel Duchesne, elder daughter of Ernest Collier Duchesne, of Oakwood, Bishop Stortford, Herts.

DEATHS.

ATKINSON.—On May 23rd, at his residence, Comeragh-road, West Kensington, W., John Mitford Atkinson, M.B., aged 60.

CODD.—On May 24th, at Holwood Lodge, Bromley, Kent, of pneumonia, Arthur Frederick Gambell Codd, F.R.C.S., aged 60.

DAPHTARY.—On May 26th, at St. Peter's-square, Hammersmith, Surgeon-Major G. R. Daphtary, I.M.S., retired.

POPE.—On May 4th, officially reported missing, believed drowned on the occasion of the torpedoing of s.s. *Transylvania*, Charles A. W. Pope, M.A., M.B. Cantab., Captain R.A.M.C.

SMITH.—On May 23rd, at a nursing home after a brief illness, Thomas Smith, M.R.C.S., L.R.C.P., aged 47.

TILBURY.—Missing, and believed drowned in the Mediterranean on May 4th, Captain Arthur Tilbury, R.A.M.C., M.R.C.S., L.R.C.P. Lond., aged 29.

WOODROFFE.—On May 21st, John FitzHenry Woodroffe, M.D., of Conna, Shankill, co. Dublin, late of Craven Park, Harlesden, N.W., aged 61.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Notes, Short Comments, and Answers to Correspondents.

THE VICTUALLING OF THE ROYAL NAVY.

AN appeal for contributions of vegetables and fruit in large quantities for the Navy, issued a few weeks ago, serves to draw attention to the fact that the food-supplies of civilians and the Army have been far more freely discussed than those of the Navy. Nevertheless, diet and disease, especially on board ship, is a subject of continued interest and speculation. In 1903 a little book of 30 pages was written by Dr. Alexander Turnbull, Inspector-General of Hospitals and Fleets (retired), and published by Elliot Stock at the price of 1s., entitled "The Victualling of the Royal Navy, Past, Present, and Future: A Practical Statement compiled from State Papers, Historic Documents, and Official Sources, 1486-1903 and After." The author says:—

> Owing to the courtesy of the Director and the Assistant Director of Victualling, I am enabled to furnish a chronological record of the more important improvements in the naval ration, premising that of late years there has been great improvement in the quality of the provisions supplied. In 1803 sugar and tea were introduced as substitutes for butter and cheese, and by 1824 had replaced those perishable articles. Surgeon Thomas Trotter, M.D., R.N., in his memorable treatise on scurvy (London, 1792), furnishing valuable evidence as to the victualling of the Navy in his time, indicated the authorised issue of cocoa at the end of the eighteenth century. A vegetable ration was introduced between 1806 and 1810; it is, however, possible that by means of the legalised and the prior non-legalised system of "savings" the seamen may have been able to purchase vegetables in harbour on their own account. Beer as a ration was finally abolished in 1831, but on foreign stations long prior to this spirits and wine had of necessity been substituted. In 1832 chocolate was substituted for cocoa, and a most popular substitution this proved to be; "ship's cocoa," as it is called, is an excellent breakfast beverage, sustaining and restorative. In the "sixties" several improvements in naval victualling were introduced; pepper and mustard were added in 1860. Preserved meats were reintroduced, preserved potato, rice, and celery seed, as a flavouring for pea-soup, were introduced into the seaman's dietary in 1867. Soft bread, when in harbour and it can be procured, was authorised as an alternative for biscuit in 1868, and in the same year soluble chocolate was supplied for special issues, in stress of weather, &c., it being more expeditiously prepared than chocolate ordinary, which requires prolonged boiling in its preparation. The final addition was salt.

Reference is made to the preserved meats as supplied to the Victorian Navy in the first instance:—

> The first preserved meats were supplied by Mr. Goldner, of Galatz, in Roumania, where cattle were cheaper than in this country. The first contract was in 1844, for five years, and then renewed. Goldner was a name familiar to naval officers in the "fifties," and long afterwards execrated by "all hands" in the Fleet, in connexion with these atrocious supplies, which were condemned wholesale in the naval victualling yards and afloat as unfit for human food, as it was known that they had been supplied to our Arctic explorers' ships. Some tins were found to contain offal, and some maintained—for which, however, there is no official support, as for the offal—that horses' hoofs and even shoes had been found "canned" by Goldner; numerous tins were bulged by the putrescence of their contents, indicating that their varied contents had not even been effectively preserved.

THE COST OF STARTING A COTTAGE HOSPITAL.

To the Editor of THE LANCET.

SIR,—I live in a village of some 800 inhabitants 16 miles from the nearest hospital town by road and much more by rail. There are 8-10 villages in a short radius similarly situated. We desire after the war to start a real cottage hospital with three or four beds, which would also serve as headquarters for, say, two district nurses. I should be much obliged if any of your readers could give me any information as to cost, &c., from their own experience in similar cases.

I am, Sir, yours faithfully,

May 24th, 1917. N. G.

THE TEACHING OF SEX HYGIENE.

WE have received from the National League for Physical Education and Improvement a series consisting of a pamphlet and four leaflets designed to give parents help in instructing their children in a subject which presents many difficulties, but which is of great importance to the welfare of the child. The pamphlet is by Mrs. House, and is in the form of an address to parents on the moral training of boys and girls, the leaflets being intended to be read respectively to a little child, a boy of 12 to 14, a girl of 11 to 13, and older boys and girls. Their aim is to encourage boys and girls to treat their bodies reverently and not hesitate, through a sense of false shame, to seek from older persons and responsible teachers the information for which the coming of adolescence may prompt a desire. The price of the series is 5*d.* from 4, Tavistock-square, London, W.C.

A SANCTUARY FOR LITTLE PILGRIMS.

UNDER this title Messrs. John Bale, Sons, and Danielsson are publishing at the price of 1s. an illustrated record of the progress of the work of the Sanatorium for Tuberculous Children at Harpenden, Herts, which is a special branch of the National Children's Home and Orphanage. The account is written by Dr. T. N. Kelynack, medical adviser to the Home and visiting physician to the Sanatorium, and there is an introduction by Sir Charles Wakefield, Lord Mayor of London, one of the treasurers, and a foreword by the Rev. William Hodson Smith, the principal. The National Children's Home and Orphanage, which has 15 branches in England and Wales and a centre in Canada, has over 2500 destitute and distressed children in its care and is doing an excellent work. The sanatorium, which was opened in June, 1910, has well justified its existence. Educational training is provided for all children of school age, an open-air school being, of course, a special feature. Even without the letterpress the pictures in the little book themselves tell the story of sickness relieved and children's lives made happy. The London offices of the institution are 104–122, City-road, E.C.

FLOUR VALUE.

To the Editor of THE LANCET.

SIR,—The amount of our labour being dependent on our food supply, and this owing to present conditions limited, would it not be wise for the Food Controller to have every sack of flour labelled with the composition and qualities of its contents? Many cases of indigestion come before me, said to be due to the bread not being perfectly made. At this one is not surprised, as the baker little knows what he is using, and is possibly making experiments at the public expense; if he knew the material he was dealing with, I think the public would be better supplied. "To be forewarned is to be forearmed."

I am, Sir, yours faithfully,
JOHN MCOSCAR, L.R.C.P.Lond., M.R.C.S.Eng.

Buxton, May 13th, 1917.

Justice.—We are not aware of the circumstances in which the Essex Insurance Committee may have refused to allow insured persons to make their own arrangements for medical treatment, but we point out that in the report in our article the London Panel Committee expressly referred to the small number of applications made to them to that effect, and drew a conclusion which does not appear unreasonable.

Medical Diary for the ensuing Week.

SOCIETIES.

RÖNTGEN SOCIETY, at the Cancer Hospital (Free), Fulham-road, S.W.

TUESDAY.—8.15 P.M., Annual General Meeting. Election of Officers and Council for the Session 1917-1918. Adjourned Discussion on the Future of the British X Ray Industry (opened by Capt. R. Knox). Lieut.-Col. R. Wilson, C.A.M.C., Mr. J. H. Webb, and Mr. H. C. Head are expected to take part.

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.

TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

WEDNESDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

NORTH-EAST LONDON POST-GRADUATE COLLEGE, Prince of Wales's General Hospital, Tottenham, N.

MONDAY.—Clinics:—10.30 A.M., Surgical Out-patients (Mr. R. Gillespie). 2.30 P.M., Medical Out-patients (Dr. T. R. Whipham): Gynæcological Out-patients (Dr. Banister). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

TUESDAY.—2.30 P.M., Surgical Operations (Mr. Carson). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. Howell Evans): Nose, Throat, and Ear Out-patients (Mr. C. H. Hayton). Radiography (Dr. Metcalfe). 3.30 P.M., Medical In-patients (Dr. A. J. Whiting).

WEDNESDAY.—Clinics:—2.30 P.M., Throat Operations (Mr. C. H. Hayton). Children Out-patients (Dr. T. R. Whipham); Eye Out-patients (Mr. R. P. Brooks); Skin Out-patients (Dr. H. W. Barber). 5.30 P.M., Eye Operations (Mr. R. P. Brooks).

THURSDAY.—2.30 P.M., Gynæcological Operations (Dr. A. E. Giles). Clinics:—Medical Out-patients (Dr. A. J. Whiting); Surgical Out-patients (Mr. Carson); Radiography (Dr. Metcalfe). 3 P.M., Medical In-patients (Dr. R. M. Leslie).

FRIDAY.—2.30 P.M., Surgical Operations (Mr. Howell Evans). Clinics:—Medical Out-patients (Dr. A. G. Auld); Surgical Out-patients (Mr. E. Gillespie); Eye Out-patients (Mr. R. P. Brooks).

ROYAL INSTITUTE OF PUBLIC HEALTH, Lecture Hall of the Institute, 37, Russell-square, W.C. 1.

Course of Lectures and Discussions on Public Health Problems under War and After-war Conditions:—

WEDNESDAY.—4 P.M., Lecture VIII.:—Mr. B. S. Rowntree: Welfare Work in Factories. Followed by a discussion.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

We cannot undertake to return MSS. not used.

Offices: 423, STRAND, LONDON, W.C. 2.

MANAGER'S NOTICES.

ALTERATION IN THE PRICE OF "THE LANCET."

INCREASED war expenses and cost of production necessitate an increase of the price of THE LANCET. Commencing with the new year, the price was raised to 8*d*. The rates of subscription remain as revised in October.

TO SUBSCRIBERS.

WILL Subscribers please note that only those subscriptions which are sent direct to the Proprietors of THE LANCET at their Offices, 423, Strand, London, W.C. 2, are dealt with by them? Subscriptions paid to London or to local newsagents (with none of whom have the Proprietors any connexion whatever) do not reach THE LANCET Offices, and consequently inquiries concerning missing copies, &c., should be sent to the Agent to whom the subscription is paid, and *not* to THE LANCET Offices.

Subscribers, by sending their subscriptions direct to THE LANCET Offices, will ensure regularity in the despatch of their Journals and an earlier delivery than the majority of Agents are able to effect.

THE COLONIAL AND FOREIGN EDITION is published in time to catch the weekly Friday mails to all parts of the world.

TO COLONIAL AND FOREIGN SUBSCRIBERS.

Subscribers abroad are particularly requested to note the rates of subscriptions given on page 6.

The Manager will be pleased to forward copies direct from the Offices to places abroad at the rates shown, whatever be the weight of any of the copies so supplied.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, May 30th, 1917.

Date.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
May 24	...	114	69	55	55	59	Cloudy
,, 25	...	110	72	54	58	63	Fine
,, 26	...	121	80	59	62	68	Fine
,, 27	...	120	81	56	62	71	Fine
,, 28	...	125	79	58	60	68	Fine
,, 29	...	120	78	55	59	63	Fine
,, 30	0·35	107	68	55	54	60	Cloudy

Other information which we have been accustomed to give in these Readings" is withheld for the period of the war.

BOOKS, ETC., RECEIVED.

ALLEN, GEORGE, AND UNWIN.
Root and Branch. By R. Allatini. 6s.
Physical Education in Relation to School Life. By Reginald E. Roper, M.A. 2s 6d. net.
Proposals for the Prevention of Future Wars. By Viscount Bryce and Others. 1s. net.

BAILLIÈRE, TINDALL, AND COX, London.
Surgical Therapeutics and Operative Technique. By E. Doyen. English edition prepared by the Author in collaboration with H. Spencer-Browne, M.B. Cantab. Price 25s. net.

BELL, G., AND SONS, Ltd., London.
One Hundred Points in Food Economy. By J. Grant Ramsay, F.R.E.S., with Preface by W. D. Halliburton, M.D., F.R.C.P., LL.D., F.R.S. 1s. net.

CASSELL AND CO., London, New York, Toronto, and Melbourne.
Tumours, Innocent and Malignant: Their Clinical Character and Appropriate Treatment. By Sir John Bland Sutton, LL.D., F.R.C.S. Sixth edition. 21s. net.

FROWDE, H., AND HODDER AND STOUGHTON, London.
Elements of Hygiene and Public Health: Text-book for Students and Practitioners of Medicine. By Charles Porter, M.D., B.Sc., M.R.C.P. Edin. 12s. 6d. net.
The Pneumothorax Treatment of Pulmonary Tuberculosis. By Charles Riviere, M.D. Lond., F.R.C.P. 6s. net.

GREEN, W., AND SON, Edinburgh and London.
The Cancer Problem: A Statistical Study. New edition. By C. E. Green, F.R.S.E.

HOEBER, PAUL B., New York.
Cancer: Its Cause and Treatment. By L. Duncan Bulkley, A.M., M.D. Vol. II. $1.50.
Internal Secretions: Their Physiology and Application to Pathology. By E. Gley, M.D. Translated from the French and edited by Maurice Fishberg, M.D. $2.00.

MACMILLAN AND CO., London and New York.
Public Health Nursing. By Mary Sewall Gardner, R.N. With an Introduction by M. Adelaide Nutting. 7s. 6d. net.
Elements of Anatomy and Physiology for Nurses. By Percy M. Dawson, M.D. 7s. 6d. net.

METHUEN AND CO., London.
Staying the Plague. By N. Bishop Harman, M.A., M.B. Cantab. 1s. net.

WILEY, JOHN, AND SONS, New York; CHAPMAN AND HALL, London.
Laboratory Manual of Organic Chemistry for Medical Students. By Matthew Steel, Ph.D. 6s. net.
Lessons in Pharmaceutical Latin and Prescription Writing and Interpretation. By Hugh C. Muldoon, Ph.G. 6s. net.

The following journals, magazines, &c. have been received:—
Archives of Radiology and Electro-Therapy, Archives de Médecine et de Pharmacie Militaires, American Journal of Orthopedic Surgery, Journal of Hygiene, Clinical Medicine, American Journal of Surgery, North American Review, Canadian Medical Association Journal, Journal of the Missouri State Medical Association, Pacific Medical Journal, Arkiv för Kirurgi, Ophthalmology Bulletin of the Johns Hopkins Hospital, American Journal of Syphilis, American Journal of Roentgenology, American Medicine, Public Health.

Communications, Letters, &c., have been received from—

A.—Anglo-French Drug Co., Lond.; Messrs. Arnold and Sons, Lond.; Archives et Documents de Guerre, Val de Grace, Directeur de; Major T. M. Allison, R.A.M.C.(T.); Messrs. Allen and Hanburys, Lond.; Mr. H. W. Abbott, Lond.; Aberdeen, Medical Officer of Health of; Anglo-Russian Hospital, Sec. of; A. P. W.

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C.—Cambridge Hospital Medical Library, Aldershot, Librarian of; Messrs. R. Cook and Co., Lond.; County Asylum, Prestwich, Clerk to the; Cheadle Royal, Manchester, Trustees of.

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T.—Mr. A. Tennant, Lond.; Dr. K. Taylor; T. H. G.

V.—Victoria Hospital, Liscard, Matron of.

W.—Dr. R. Wilkinson, Lond.; Capt. W. J. Wilson, R.A.M.C.; Capt. H. J. Wheeler, R.A.M.C.; West Kent General Hospital, Maidstone, Sec. of; W. M.; Messrs. Waring and Gillow, Lond.; West Bromwich District Hospital, Sec. of; Mrs. Wright, Worthing.